DEPARTMENT OF THE AIR FORCE
AIR FORCE CIVIL ENGINEER CENTER

APR 10 2014

MEMORANDUM FOR: U.S. Environmental Protection Agency – Region 2
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New York State Department of
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New York State Department of Health
Bureau of Environmental Exposure
Investigation
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28 Hill Street, Suite 201
Oneonta, NY 13820

FROM: AFCEC/CIBE Griffiss
Building 45
706 Brooks Road
Rome, New York 13441

SUBJECT: Draft Proposed Plan Soil Vapor Intrusion at
SD052-02 Building 775 Site (Buildings 774 and 776) and
SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786)
Former Griffiss Air Force Base (AFB) Rome, New York

1. Enclosed is the "Draft Proposed Plan for Soil Vapor Intrusion at SD052-02 Building 775 Site (Buildings 774 and 776) and SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786)", for your review and comment.

2. Request review comments, if any, be provided by May 29, 2014. Should you have any questions or concerns please contact me at 315 356 0810 ex 202.

MICHAEL F. MCDERMOTT
Air Force Civil Engineer Center
AFCEC/CIBE Griffiss

Enclosures; As Noted

DRAFT
PROPOSED PLAN

SOIL VAPOR INTRUSION AT
SD-052-02 BUILDING 775 SITE [BUILDINGS 774 AND 776] AND
SD-052-01 APRON 2 CHLORINATED PLUME SITE [BUILDINGS 785 AND 786]
FORMER GRIFFISS AIR FORCE BASE SITE
ROME, NEW YORK

Air Force Civil Engineer Center
Building 45
706 Brooks Road
Rome, New York 13441

April 2014

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LIST OF ACRONYMS

acfm	actual cubic feet per minute
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
$AF_{s/ia}$	Attenuation factor
AOC	Area of Concern
ARARs	Applicable or Relevant and Appropriate Requirements
ATc	Averaging Time Cancer
ATnc	Averaging Time Non-Cancer
ATSDR	Agency for Toxic Substances and Disease Registry
bgs	below ground surface
BRAC	Base Realignment and Closure Act
BW	Body Weight
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of Concern
DCE	Dichloroethylene
EPA	Environmental Protection Agency
FFA	Federal Facility Agreement
FS	Feasibility Study
ft	feet
GAC	granular activated carbon
HVAC	Heating, ventilation, and air conditioning
in w.g.	inches of water gauge
kg	kilograms
LTM	Long Term Monitoring
LUC/IC	Land Use Control/Institutional Control
m^3	cubic meter
µg/L	micrograms per liter
$\mu g/m^3$	micrograms per cubic meter
NCP	National Contingency Plan
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation

LIST OF ACRONYMS (continued)

NYSDOH	New York State Department of Health
O&M	Operation and Maintenance
OSWER	Office of Solid Waste and Emergency Response
PVC	Poly vinyl chloride
RI	Remedial Investigation
ROD	Record of Decision
ROI	Radius of Influence
RSL	Regional Screening Level
SAC	Strategic Air Command
scfm	standard cubic feet per minute
sq. ft	square feet
SSVM	sub-slab vapor mitigation
SVI	Soil vapor intrusion
TBC	to-be-considered
TCE	trichloroethylene
TR	target risk
VC	Vinyl Chloride
VMP	Vapor monitoring points
VOC	Volatile Organic Compound

1 INTRODUCTION

This Proposed Plan is issued by the United States Air Force (Air Force) following consultation with the United States Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC). The Air Force recommends soil vapor intrusion (SVI) mitigation by sub-slab depressurization at SD-052-02 Building 775 Site [Buildings 774 and 776] and SD-052-01 Apron 2 Chlorinated Plume Site [Buildings 785 and 786] at the former Griffiss Air Force Base (AFB).

This document has been prepared in accordance with public participation requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, the National Contingency Plan (NCP), and the former Griffiss AFB Federal Facility Agreement (FFA). In this document, the Air Force, EPA, and NYSDEC will be referred to as “the agencies.” This proposed plan summarizes the previous investigations and SVI mitigation alternatives presented in the Feasibility Study (FS) conducted for the sites.

This plan is intended to elicit public comments on the proposal for SVI mitigation by sub-slab depressurization at the sites. The final decision or Record of Decision (ROD) will be made only after the public comment period has ended and responses and information submitted during this time period have been reviewed and considered. Please refer to the Community Participation section at the end of this document for information on submitting public comments.

2 SITE BACKGROUND

2.1 Site Description

2.1.1 Regional

The former Griffiss AFB covered approximately 3,552 contiguous acres in the lowlands of the Mohawk River Valley in Rome, Oneida County, New York. Topography within the valley is relatively flat, with elevations on the former Griffiss AFB ranging from 435 to 595 feet (ft) above mean sea level. Three Mile Creek, Six Mile Creek (both of which drain into the New York State Barge Canal, located to the south of the base), and several state-designated wetlands are located on the former Griffiss AFB, which is bordered by the Mohawk River on the west. Due to its high average precipitation and predominantly silty sands, the former Griffiss AFB is considered a groundwater recharge zone.

2.1.2 Griffiss AFB Operational History

The mission of the former Griffiss AFB varied over the years. The base was activated on February 1, 1942, as Rome Air Depot, with the mission of storage, maintenance, and shipment of material for the U.S. Army Air Corps. Upon creation of the U.S. Air Force in 1947, the depot was renamed Griffiss AFB. The base became an electronics center in 1950, with the transfer of Watson Laboratory Complex (later Rome Air Development Center [1951], Rome Laboratory, and then the Information Directorate at Rome Research Site, established with the mission of accomplishing applied research, development, and testing of electronic air-ground systems). The

49th Fighter Interceptor Squadron was also added. The Headquarters of the Grounds Electronics Engineering Installations Agency was established in June 1958 to engineer and install ground communications equipment throughout the world.

On July 1, 1970, the 416th Bombardment Wing of the Strategic Air Command (SAC) was activated with the mission of maintenance and implementation of both effective air refueling operations and long-range bombardment capability.

Griffiss AFB was designated for realignment under the Base Realignment and Closure Act (BRAC) in 1993 and 1995, resulting in deactivation of the 416th Bombardment Wing in September 1995. The Information Directorate at Rome Research Site and the Northeast Air Defense Sector will continue to operate at their current locations; the New York Air National Guard operated the runway for the 10th Mountain Division deployments until October 1998, when they were relocated to Fort Drum. The Defense Finance and Accounting Services has established an operating location at the former Griffiss AFB.

2.1.3 Environmental Background

As a result of the various national defense missions carried out at the former Griffiss AFB since 1942, hazardous and toxic substances were used and hazardous wastes were generated, stored, or disposed at various sites on the installation. The defense missions involved, among others, procurement, storage, maintenance, and shipping of war materials; research and development; and aircraft operations and maintenance.

Numerous studies and investigations under the U.S. Department of Defense Installation Restoration Program have been carried out to locate, assess, and quantify the past toxic and hazardous waste storage, disposal, and spill sites.

These investigations included a records search in 1981, interviews with base personnel, a field inspection, compilation of an inventory of wastes, evaluation of disposal practices, and an assessment to determine the nature and extent of site contamination; Problem Confirmation and Quantification studies (similar to what is now designated a Site Investigation) in 1982 and 1985; soil and groundwater analyses in 1986; a base-wide health assessment in 1988 by the U.S. Public Health Service, Agency for Toxic Substances and Disease Registry (ATSDR); base-specific hydrology investigations in 1989 and 1990; a groundwater investigation in 1991; and site-specific studies and investigations between 1989 and 1995. The ATSDR issued a Public Health Assessment for Griffiss AFB, dated October 23, 1995, and an addendum, dated September 9, 1996.

Pursuant to Section 105 of CERCLA, Griffiss AFB was included on the National Priorities List (NPL) on July 15, 1987. On August 21, 1990, the agencies entered into a FFA under Section 120 of CERCLA. On March 20, 2009, 2,897.2 acres were deleted from the NPL.

Under the terms of the agreement, the Air Force was required to prepare and submit numerous reports to the EPA and NYSDEC for review and comment. These reports address remedial activities that the Air Force is required to undertake under CERCLA and include identification of areas of concern (AOCs) on base. A scope of work for a Remedial Investigation (RI), a work plan for the RI, including a sampling and analysis plan and a quality assurance project plan, a baseline risk assessment, a community relations plan and an RI report were developed. The Air Force delivered the draft-final RI report covering 31 AOCs to the EPA and NYSDEC on December 20, 1996. Additional site-specific reports for these sites included: the final RI for Nosedocks/Apron 2 (FPM Group, Ltd., April 2004), the final FS for Building 775 (Ecology and Environment, Inc., April 2005), the FS for Nosedocks/Apron 2 (FPM Group, Ltd., May 2005), Assumptions and Screening Levels for SVI Evaluation (FPM Group, Ltd., October 2007), and a SVI Evaluation at Buildings 774, 776, 785, 786, and 817 (FPM Group, Ltd., July 2008).

This proposed plan for SVI mitigation is based on the results from the FS conducted in 2008 for SVI at Buildings 774, 776, 785, and 786. The FS evaluated all available alternatives based on:

- Evaluation of potential threats to human health and the environment,
- Prevention of contaminants from entering the interior of buildings, and
- Technical and cost effectiveness.

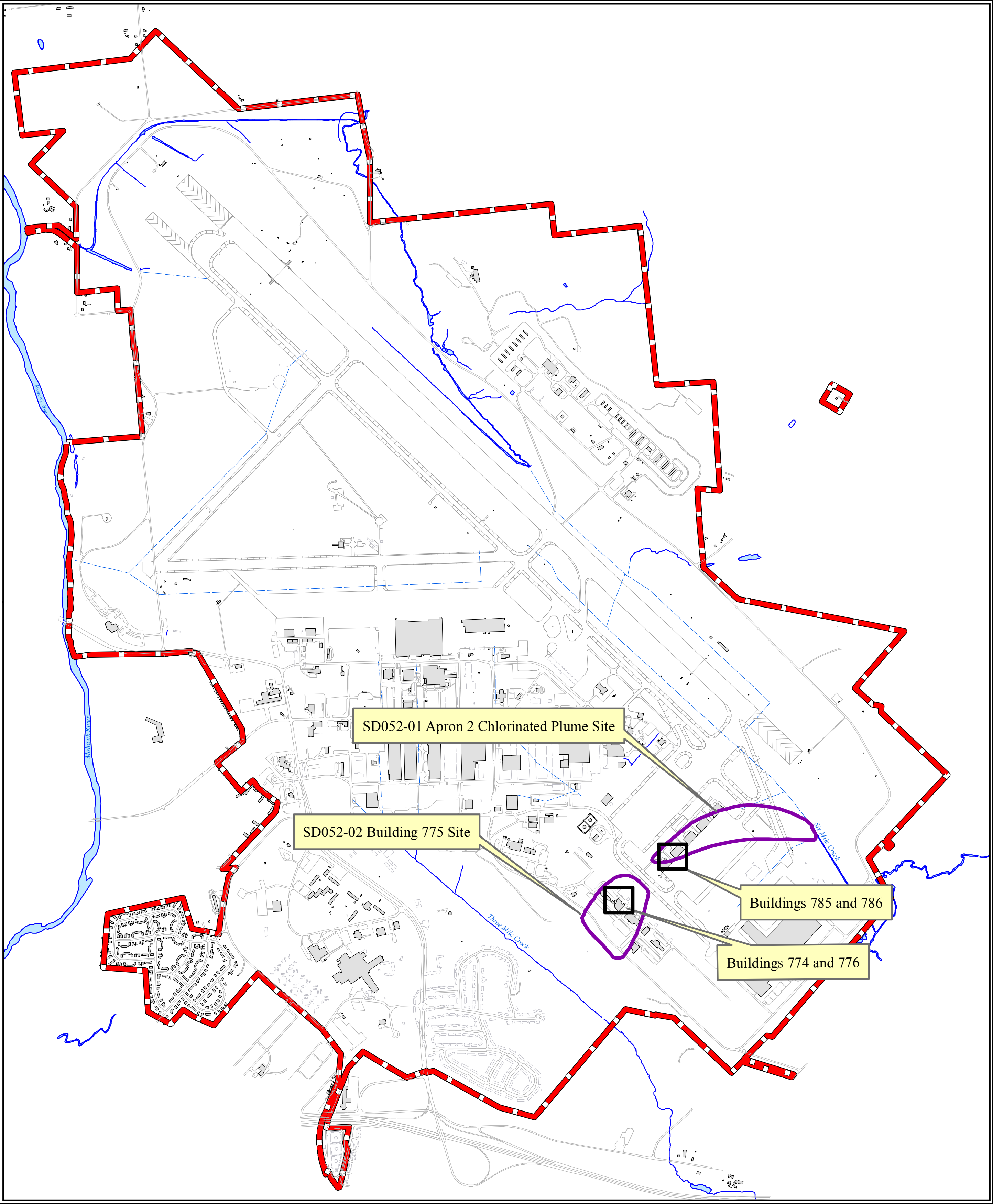
Soil vapor analytical results were compared to the Air Force Industrial/Commercial SVI Screening Levels. These values were calculated using conservative assumptions for SVI screening levels and are calculated based on human health risk-based concentrations for inhalation of indoor air quality and for soil vapor under an industrial/commercial scenario. However, these screening levels are not intended to replace a more formal human health risk analysis process that incorporates site-specific risk management considerations.

2.2 Site Description and History

2.2.1 Buildings 774 and 776

These two buildings are located between Phoenix Drive and Patrol Road at the former Griffiss AFB in Rome, NY (Figure 1). SVI at these buildings is associated with the Building 775 Site (SD-52-02). Building 774 is a one-story, 18,990-square feet (sq. ft.) office building, currently occupied by a computer/security firm. The building is occupied on work days from 8 AM to 5 PM by approximately 45 people. Building 774 was built in 1959, but underwent major renovations in 2000. New windows and doors were installed along with 36 new air handlers including new air ducts in ceilings and new cooling towers. The building's foundation is an 8-inch thick concrete slab with no basement. The floors are mostly carpeted except for the bathrooms, janitor's closet and boiler room where floor drains exist.

Building 776 is a one-story, 27,410-sq. ft. office building, currently occupied by a software development firm. The building is occupied on work days from 7 AM to 6 PM by approximately 80 people. Building 776 was built in 1959, but underwent major renovations in 2002. New windows, which do not open, and doors were installed, the interior was refinished and most floors were covered with new carpeting. Heat and outdoor air are provided through 43 heat pumps. The building is built on a 3.5 to 6-inch thick concrete slab, with no basement. Several



Base Location

Key to Features

- IRP Site
- Road/Airfield
- Storm Drain
- Surface Water
- Base Boundary
- Demolished Facility
- Existing Facility
- Site Location

Figure 1
Buildings 774, 776, 785, and 786
Site Locations

1,200 600 0 1,200 2,400
Feet

N

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ROME, NEW YORK

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floor drains exist in bathrooms and one crack was observed in the concrete floor near the southeastern entrance door.

2.2.2 Buildings 785 and 786

Buildings 785 and 786 are located on the southwestern corner of Apron 2 between Aprons 1 and 2 (Figure 1). SVI at these buildings is associated with the Apron 2 Chlorinated Plume Site (SD-52-01). Each building is 28,251-sq.ft and are currently unoccupied airplane hangars. The buildings are largely open with several first and second floor offices on the buildings' interior perimeters. Buildings 785 and 786 were built in 1959 on a 13.5 to 14-inch thick, unsealed concrete slab. These buildings served as aircraft maintenance facilities (nose docks) and were taken out of service in 1995 after the Griffiss AFB was realigned. Building 786 was occupied for a few years by a pallet refurbishing company. The facilities are presently being used for storage by the Griffiss International Airport authorities. Any cracks in the floor surface were repaired and painted throughout the use of the buildings. All heating and air handling equipment is in a state of disrepair and assumed inoperable. The buildings are poorly sealed due to broken windows, open hangar doors, and missing exterior sheet metal.

2.2.3 Geology and Hydrogeology

Buildings 774 and 776 are located on SAC hill which is an elevated area in the southeast section of the former Griffiss AFB, overlooking the Aprons. The immediate area around the building is flat with little or no elevation difference. The area is covered with grass, asphalt parking lots, roads, and concrete walkways. Past investigations have indicated that the groundwater flow direction is in the south-southwesterly direction towards Landfill 6.

The aquifer is comprised of silty sands with an average thickness extending from 60 ft below ground surface (bgs) to 120 ft bgs, where shale bedrock is encountered. Due to a relatively flat gradient, average groundwater velocities at this site are slow and have been estimated at approximately 10 ft per year. Higher velocities may exist in discontinuous seams of coarse sand and gravel. Contamination is not found in the bedrock.

The immediate area surrounding Buildings 785 and 786 is relatively flat, mostly covered with reinforced concrete and has little or no elevation difference. A groundwater divide exists at Building 786, which causes low groundwater velocities in the area. Past investigations have indicated that flow direction is in the northeasterly direction towards Six Mile Creek.

3 SUMMARY OF SITE ACTIVITIES

3.1 SD-052-02 Building 775 Site [Buildings 774 and 776]

3.1.1 Groundwater Investigation:

As previously stated, these buildings are influenced by the Building 775 Site which is associated with a trichloroethylene (TCE) contaminated groundwater plume. The Building 775 Site plume is located downgradient and south of former maintenance facilities in Buildings 774 and 776 and former fuel pump house Building 775. Solvent use in Building 774 is thought to be a primary source of contamination. Solvent use was widespread in these facilities in the 1950s, 1960s, and early 1970s. The contaminated groundwater is assumed to be the source of the contaminated soil vapors.

FPM Group, Ltd. initiated long term monitoring (LTM) of groundwater at Landfill 6 in June 2006. Several of the monitoring wells sampled under the LTM program for Landfill 6 are located along Perimeter Road and therefore are located near or on the Building 775 Site (Figure 2). Sampling results showed TCE detections up to 96 micrograms per liter (µg/L) (the NYSDEC Class GA Groundwater Standard is 5 µg/L). As part of the FS for the site, additional groundwater sampling was performed. TCE was the only contaminant reported in exceedance. Eight exceedances were reported for monitoring wells 775MW-2, -5, -6, -8, -10, -20, -27, and -28, ranging from 5.76 µg/L to 82 µg/L. The groundwater remedy for the SD-52-02 (Building 775 Site AOC) has been installed in accordance with the On-Base Groundwater AOC ROD which was signed by the EPA in March 2009.

3.1.2 SVI Investigation:

In September 2006, Ecology and Environment Engineering P.C. performed an SVI evaluation consisting of sub-slab vapor samples from Buildings 774 and 776. The results indicated that chloroform and TCE were present at concentrations above their respective screening levels. The indoor air samples collected from both buildings indicated that these same contaminants were present but at levels below the screening values.

As part of the On-Base Groundwater Performance Based Contract, Ecology and Environment Engineering P.C. performed an additional SVI survey at Buildings 774 and 776 between October 2006 and February 2007. As part of this survey:

- Four soil vapor samples were collected from open grassy areas south of the buildings towards Perimeter Road (Figure 2).
- Two sub-slab vapor samples collected in each Buildings 774 and 776.
- Two indoor air samples collected in each building, and
- One outdoor air sample collected between the two buildings.

The results indicated that the soil vapor samples showed TCE detections up to 70 micrograms per cubic meter ($\mu g/m^3$) (775-SV-03), the sub-slab samples showed TCE concentrations up to 3,000 $\mu g/m^3$ (776SSV-1), and the indoor samples showed TCE concentrations up to 4.4 $\mu g/m^3$ in Building 776 (776IA-1).

After the initial SVI survey, a meeting was held between the Air Force, Air Force Institute for Operational Health, NYSDEC, New York State Department of Health (NYSDOH), and the EPA on December 13, 2007 to discuss the SVI survey findings. During this meeting, an agreement was reached that these buildings required additional investigation to confirm the 2006 survey results. This SVI investigation was performed in April/May 2008. During this survey the following samples were collected:

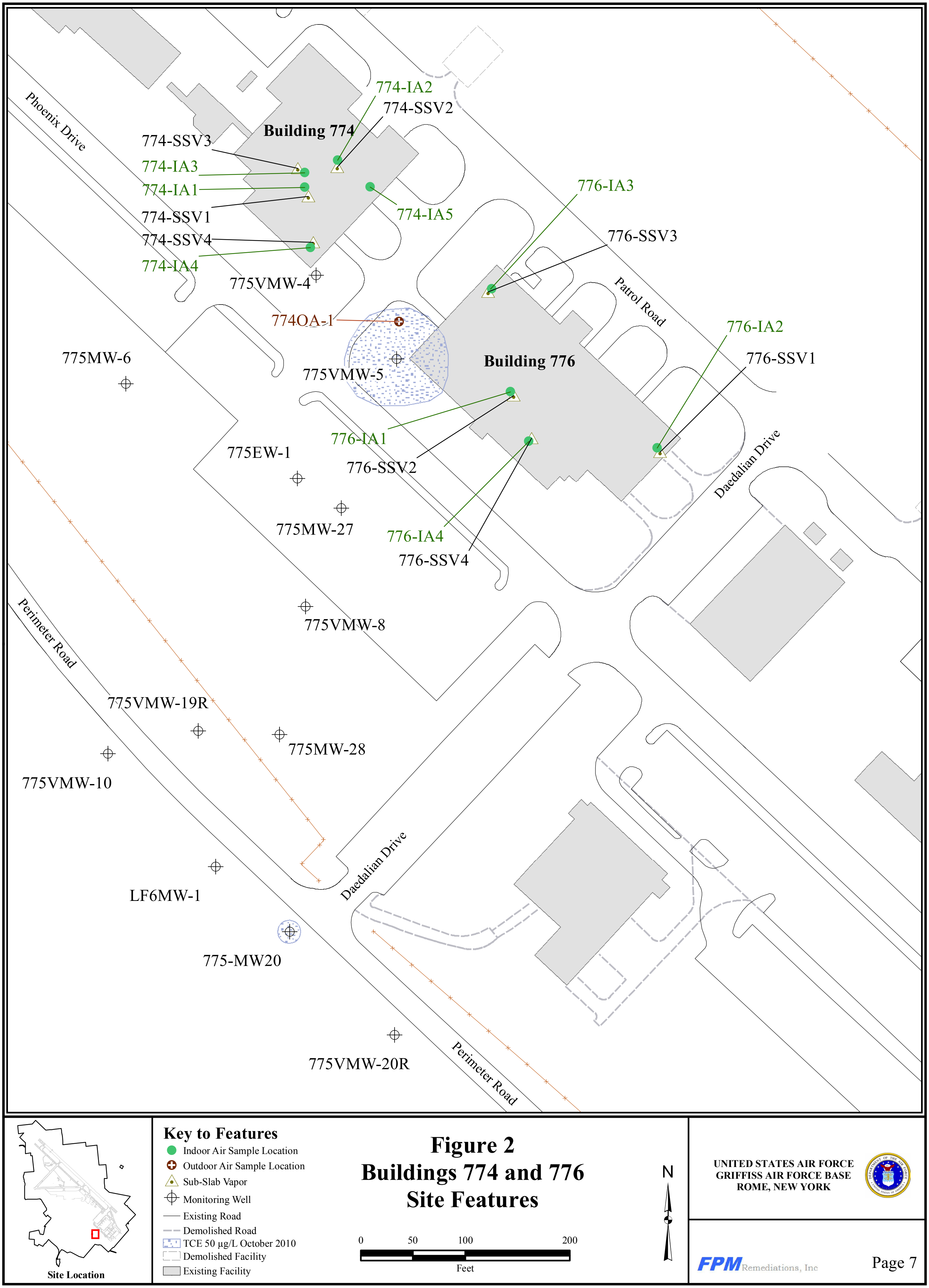

Figure 2
Buildings 774 and 776 Site Features

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ROME, NEW YORK

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- Four sub-slab vapor samples from beneath Buildings 774 and 776 (each),
- Four indoor air samples from within each building, and
- One outdoor background air sample.

The indoor air TCE concentrations reported for Building 774 during the April 2008 sampling event were two orders of magnitude higher than those reported during the 2006 sampling event. Exceedance concentrations ranged from 236 $\mu g/m^3$ (774IA-4) to 559 $\mu g/m^3$ (774IA-2). Further investigation revealed, that prior to this sampling event, building renovations were performed which included removal of old carpet glue using solvents. Indoor air results for Building 776 were comparable to the previous results. Indoor and outdoor air samples were recollected from Building 774 in May 2008 due to the apparently skewed results. All of the May 2008 results indicated that indoor air TCE concentrations were comparable to the 2006 results. The indoor/outdoor sampling results for Building 774 and 776 are provided in Table 1 and 2.

The sub-slab TCE vapor results for Building 774 were within the same order of magnitude as those reported in 2006 with two exceedances of 490 $\mu g/m^3$ and 590 $\mu g/m^3$ at locations 774SSV-1 and 774SSV-2, respectively. The sub-slab vapor concentrations reported in Building 776 were lower than those reported in 2006 and did not exceed initial screening levels. The sub-slab vapor sampling results for Building 774 and 776 are provided in Table 3 and 4.

3.2 SD-052-01 Apron 2 Chlorinated Plume Site [Buildings 785 and 786]

3.2.1 Groundwater Investigation:

An RI was performed in 2002 and 2003 in which two chlorinated plumes (referred to as the southern and northern plumes) were delineated at Apron 2 and the surroundings areas. The three primary contaminants present in the groundwater that exceed NYSDEC Class GA Groundwater Standards are TCE and its breakdown products cis-1,2-Dichloroethylene (DCE) and vinyl chloride (VC). The source of the contamination is assumed to be extended use of chlorinated solvents in the nosedock facilities (Buildings 782 through 786), with potential leaks due to floor drains, sewer lines, and oil water separators.

Several petroleum contaminated plumes originating from the Apron 2 fueling system are present and commingle with the southern chlorinated groundwater plume in the area. At locations where TCE and petroleum related constituents commingle, significant reductive dechlorination is occurring and the TCE is almost completely degraded to cis-1,2 DCE and VC. The levels of TCE in both plumes have been steadily decreasing and it appears that no significant source of TCE remains at the site. Several LTM programs for petroleum and performance monitoring for chlorinated groundwater contamination are ongoing at Apron 2 to monitor and track contamination. The groundwater remedy for the SD-52-01 (Apron 2 Chlorinated Plume Site AOC) has been installed in accordance with the On-Base Groundwater AOC ROD which was signed by the EPA in March 2009.

Table 1

Building 774 AOC Detected Indoor and Outdoor Analytical Results (2006 and 2008)

Sample Location	**774IA-1**			**774IA-2**			**774IA-3**		**774IA-4**		**774IA-5**	**774OA-1**		
Sample ID	**774-IA1**	**774IA1BB**	**774IA1CA**	**774-IA2**	**774IA2BB**	**774IA2CA**	**774IA3BB**	**774IA3CA**	**774IA4BB**	**774IA4CA**	**774IA5CA**	**774-OA1**	**774OA1BB**	**774OA1CA**
Sample Type	**Indoor**	**Indoor**	**Indoor**	**Indoor**	**Indoor**	**Indoor**	**Indoor**	**Indoor**	**Indoor**	**Indoor**	**Indoor**	**Outdoor**	**Outdoor**	**Outdoor**
Sample Date	**20-Dec-2006**	**15-Apr-2008**	**29-May-2008**	**20-Dec-2006**	**15-Apr-2008**	**29-May-2008**	**15-Apr-2008**	**29-May-2008**	**15-Apr-2008**	**29-May-2008**	**29-May-2008**	**20-Dec-2006**	**15-Apr-2008**	**29-May-2008**
Sample Depth (ft above ground)	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Sample Collection Duration (hr)	**8**	**12**	**12**	**8**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**8**	**8**	**8**
Volatiles (TO-15) in µg/m^3														
cis-1,2-dichloroethene	U	1.57 J	0.685	U	U	U	U	U	U	U	U	U	U	U
trichloroethylene (tce)	2.4	347	3.99	3.4	559	4.21	389	4.7	236	2.13	6.61	U	0.492	U
vinyl chloride	U	0.13 J	U	U	U	U	U	U	U	U	U	U	U	U

Notes:

J - The analyte was positively identified, but the quantitation is an approximation.

U - Not detected.

µg/m^3: microgram per cubic meter.

Exceedance of the indoor or outdoor initial benchmark.

Table 2

Building 776 AOC Detected Indoor and Outdoor Analytical Results (2006 and 2008)

Sample Location	**776IA-1**		**776IA-2**		**776IA-3**	**776IA-4**
Sample ID	**776-IA1**	**776IA1BB**	**776-IA2**	**776IA2BB**	**776IA3BB**	**776IA4BB**
Sample Type	**Indoor**	**Indoor**	**Indoor**	**Indoor**	**Indoor**	**Indoor**
Sample Date	**20-Dec-2006**	**15-Apr-2008**	**20-Dec-2006**	**15-Apr-2008**	**15-Apr-2008**	**20-Dec-2006**
Sample Depth (ft above ground)	**5**	**5**	**5**	**5**	**5**	**5**
Sample Collection Duration (hr)	**8**	**12**	**8**	**12**	**12**	**12**
Volatiles (TO-15) in μg/m^3						
cis-1,2-dichloroethene	U	U	U	U	U	U
trichloroethylene (tce)	4.4	3.28 M	2.9	2.35	2.51	2.62
vinyl chloride	U	U	U	U	U	U

Notes:

M - A matrix effect was reported in the sample.

U - Not detected.

μg/m^3: microgram per cubic meter.

Table 3

Building 774 AOC Detected Sub-slab Vapor Analytical Results (2006 and 2008)

Sample Location	**774SSV-1**		**774SSV-2**		**774SSV-3**	**774SSV-4**
Sample ID	**774-SSV1**	**774SSV1BB**	**774-SSV2**	**774SSV2BB**	**774SSV3BB**	**774SSV4BB**
Sample Type	**SSV**	**SSV**	**SSV**	**SSV**	**SSV**	**SSV**
Sample Date	**24-Oct-2006**	**15-Apr-2008**	**24-Oct-2006**	**15-Apr-2008**	**15-Apr-2008**	**15-Apr-2008**
Sample Depth (ft bgs)	**1**	**1**	**1**	**1**	**1**	**1**
Sample Collection Duration (hr)	**8**	**12**	**8**	**12**	**12**	**12**
Volatiles (TO-15) in μg/m^3						
cis-1,2-dichloroethene	U	U	U	U	0.64	0.60
trichloroethylene (tce)	1,700	490	810	590	66	69
vinyl chloride	U	U	U	U	U	U

Notes:

U: Not detected.

μg/m^3: microgram per cubic meter.

Exceedance of the cancer screening value.

Table 4

Building 776 AOC Detected Sub-slab Vapor Analytical Results (2006 and 2008)

Sample Location	**776SSV-1**		**776SSV-2**		**776SSV-3**	**776SSV-4**
Sample ID	**776-SSV1**	**776SSV1BB**	**776-SSV2**	**776SSV2BB**	**776SSV3BB**	**776SSV4BB**
Sample Type	**SSV**	**SSV**	**SSV**	**SSV**	**SSV**	**SSV**
Sample Date	**24-Oct-2006**	**15-Apr-2008**	**24-Oct-2006**	**15-Apr-2008**	**15-Apr-2008**	**15-Apr-2008**
Sample Depth (ft bgs)	**1**	**1**	**1**	**1**	**1**	**1**
Sample Collection Duration (hr)	**8**	**12**	**8**	**12**	**12**	**12**
Volatiles (TO-15) in μg/m^3						
cis-1,2-dichloroethene	U	U	U	U	0.64	U
trichloroethylene (tce)	3,000	6.9	700	110	120	230
vinyl chloride	U	U	U	U	U	U

Notes:

U: Not detected.

μg/m^3: microgram per cubic meter.

Exceedance of the cancer screening value.

3.2.2 SVI Investigation:

As part of the On-Base Groundwater Performance Based Contract, Ecology and Environment Engineering P.C. performed an initial SVI survey at Buildings 785 and 786 between October 2006 and February 2007. As part of this investigation the following samples were collected (Figure 3):

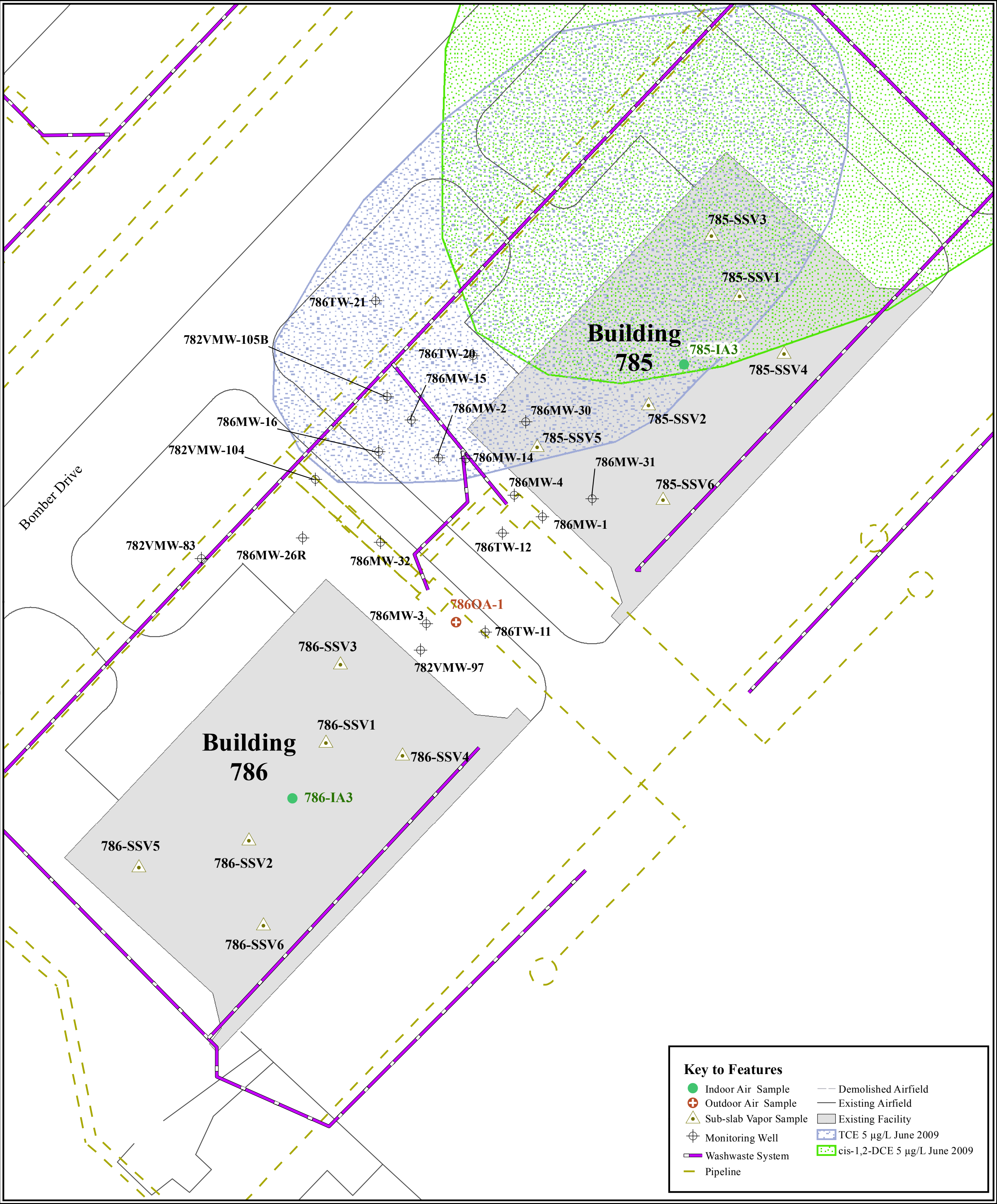
- No soil vapor samples were collected in October 2006 from around Buildings 785 and 786 because the soil was saturated from the ground surface to more than 8 ft bgs and NYSDOH guidelines suggest that no sample be collected under these conditions.
- Ten sub-slab vapor samples and one duplicate sample were collected in October 2006. Two samples from each building were collected from beneath the concrete floors of Buildings 782, 783, 784, 785, and 786 (two samples were collected due to the large size of each of the buildings). The samples were centrally located within the buildings because the center of the building typically exhibits the highest levels of sub-slab vapor.
- Two indoor air samples were collected in the same locations as the sub-slab samples previously collected.
- One outdoor air sample was collected between Buildings 785 and 786.

The results from this sampling event showed detections in the sub-slab samples up to 81,000 µg/m^3 (786SSV-1) and in indoor air samples up to 0.43 µg/m^3 (786IA-1). Several other contaminants of concern (COCs) (e.g. benzene) were reported in the sub-slab vapor and indoor air samples, but were either detected below screening levels, detected in the outdoor air sample, or not deemed to be a COC for this site. As part of the sampling procedures, site investigations and product inventories were performed. It was noted that several pallets which held drums of motor oil, paint cans, buckets, and pails were on the Southwestern side of Building 785. In Building 786, a forklift, compressed gas and propane cylinders, a container of motor oil and a bucket of hydraulic oil were reported. A ppb-RAE meter was used to measure volatile organic compound (VOC) concentrations at these locations where readings ranged from 0 to 2,800 parts per billion. The highest concentration was detected in Building 785 near the pallets.

As previously discussed, FPM Group, Ltd., performed a follow-up SVI investigation at Buildings 785 and 786 in April 2008 to confirm the results of the 2006 SVI survey. During this follow-up the following samples were collected (Figure 3):

- Six sub-slab vapor samples from each buildings,
- One indoor air sample from each building, and
- One outdoor air sample from between Buildings 785 and 786.

The indoor air TCE concentrations reported for Building 785 during this sampling round were similar in magnitude as those reported in the 2006 sampling round. A small detection of TCE (0.655 µg/m^3 at 785IA-3) and several small petroleum detections were reported. Indoor air results for Building 786 were comparable to the previous results and no TCE or daughter products were detected. The indoor/outdoor sampling results for Building 785 and 786 are provided in Table 5.



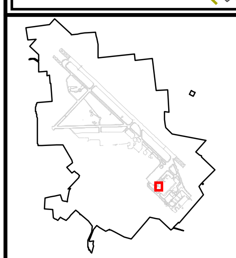


Figure 3
Building 785 & 786
Site Features

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Feet

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UNITED STATES AIR FORCE
GRIFFISS AIR FORCE BASE
ROME, NEW YORK

FPM Remediations, Inc

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Table 5

Building 785/786 AOC Short List Indoor and Outdoor Analytical Results (2006 and 2008)

Sample Location	**785IA-1**	**785IA-2**	**785IA-3**	**786IA-1**	**786IA-2**	**786IA-3**	**786OA-1**	
Sample ID	**785-IA1**	**785-IA2**	**785IA3BB**	**786-IA1**	**786-IA2**	**786IA3BB**	**786-OA1**	**786OA1BB**
Sample Type	**Indoor**	**Indoor**	**Indoor**	**Indoor**	**Indoor**	**Indoor**	**Outdoor**	**Outdoor**
Sample Date	**20-Dec-2006**	**20-Dec-2006**	**17-Apr-2008**	**20-Dec-2006**	**20-Dec-2006**	**18-Apr-2008**	**20-Dec-2006**	**18-Apr-2008**
Sample Depth (ft above ground)	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Sample Collection Duration (hr)	**12**	**12**	**12**	**8**	**8**	**12**	**12**	**12**
Volatiles (TO-15) in µg/m^3								
1,2,4-trimethylbenzene	NA	NA	1.30	NA	U	0.749	U	0.949
1,3,5-trimethylbenzene	NA	NA	0.650 F	NA	U	U	U	U
benzene	1.1	1.1	0.617	1.2	1.2	0.747	0.96	0.617
cis-1,2-dichloroethene	U	U	U	U	U	U	U	U
ethylbenzene	NA	NA	0.441 F	NA	NA	U	NA	U
m,p-xylene (sum of isomers)	NA	NA	1.28 F	NA	NA	0.750 F	NA	0.883 F
Naphthalene	NA	NA	1.33	NA	NA	1.01 J	NA	U
o-xylene	NA	NA	0.485 F	NA	NA	U	NA	0.441 F
tetrachloroethylene (pce)	U	U	U	U	0.896 F	U	U	U
toluene	NA	NA	2.72	NA	NA	1.92	NA	1.49
trichloroethylene (tce)	U	U	0.655	0.43 J	U	U	U	U
vinyl chloride	U	U	U	U	U	U	U	U

Notes:

U - Not detected.

F - The analyte was detected above the method detection limit (MDL), but below the reporting limit (RL).

J- The analyte was positvely identified, but the quantitation is an approximation.

NA- Not Available

µg/m^3: microgram per cubic meter.

Sub-slab vapor results for Building 785 were one to two orders of magnitude lower than the previous results. However, there was one exceedance that was reported for sampling location 785-SSV6 (2,200 µg/m^3). Sub-slab vapor results for Building 786 were lower but the same order of magnitude as the previous results. TCE concentrations ranged from 69 µg/m^3 at 786SSV-3 to 19,000 µg/m^3 at 786SSV-1 (previous concentration at 786SSV-1 was 81,000 µg/m^3). In total, four TCE exceedances were reported at sampling locations 786-SSV1, -SSV2, -SSV5, and -SSV6. The sub-slab vapor sampling results for Building 785 and 786 are provided in Table 6 and 7.

3.3 Exposure Assumptions

The Air Force established risk-based screening values to assess the potential for SVI at property with ongoing or planned industrial/commercial use (FPM Group, Ltd., October 2007). Under an industrial/commercial scenario, adult workers' exposure has been assumed in accordance with the EPA Office of Solid Waste and Emergency Response (OSWER). The risk-based concentrations calculated (screening values) utilize conservative assumptions that are intended for SVI screening analysis. The industrial/commercial SVI screening levels are not intended to replace a more formal human health risk analysis process that incorporates site-specific risk management considerations. The assumptions are as follows:

- Inhalation Rate of 10 cubic meter (m^3) /day. The rate is derived from the daily (24 hours/day) residential inhalation rate of 20 m^3/day adjusted to an industrial/commercial exposure of 12 hours/day.
- Exposure Frequency of 250 days/year (representing 2 weeks for vacations, holidays, and sick-time). It should be noted that this assumption is more conservative than the 225 days/year assumed in the OSWER Directive.
- Exposure Duration of 25 years.
- Averaging Time for Carcinogens (AT_c) of 365 days/year and 70 years
- Averaging Time for Noncarcinogens (AT_{nc}) of 365 days/year and 25 years
- Adult Body Weight (BW) = 70 kilograms (kg)

The future industrial/commercial exposure screening level target risk for indoor air was calculated to be 1×10^{-4} for all chemicals except TCE with a calculated target risk of 1×10^{-5}. The exposure screening level target risk for soil vapor was calculated to be 1×10^{-5}. The calculated target risk values are within EPA's acceptable excess cancer risk range of one in ten thousand and one in one million (1×10^{-4} to 1×10^{-6}).

3.4 Feasibility Study

All 2006 and 2008 SVI investigation and evaluation results were comprehensively reviewed and evaluated during the preparation of the 2009 FS (FPM Group, Ltd., 2010). The objective of the FS was to evaluate and list SVI mitigation alternatives for SD-052-02 Building 775 Site [Buildings 774 and 776] and SD-052-01 Apron 2 Chlorinated Plume Site [Buildings 785 and 786]. The FS provided the recommendation for the preferred alternative. CERCLA regulations mandate that a remedial action must be protective of human health and the environment. Based on the evaluation results

Table 6

Building 785 AOC Detected Sub-slab Vapor Analytical Results (2006 and 2008)

Sample Location	785SSV-1		785SSV-2		785SSV-3	785SSV-4	785SSV-5	785SSV-6
Sample ID	**B785-SSV1**	**785SSV1BB**	**B785-SSV2**	**785SSV2BB**	**785SSV3BB**	**785SSV4BB**	**785SSV5BB**	**785SSV6BB**
Sample Type	**SSV**	**SSV**	**SSV**	**SSV**	**SSV**	**SSV**	**SSV**	**SSV**
Sample Date	**24-Oct-2006**	**17-Apr-2008**	**24-Oct-2006**	**17-Apr-2008**	**17-Apr-2008**	**17-Apr-2008**	**17-Apr-2008**	**17-Apr-2008**
Sample Depth (ft bgs)	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Sample Collection Duration (hr)	**8**	**12**	**8**	**12**	**12**	**12**	**12**	**12**
Volatiles (TO-15) in $\mu g/m^3$								
1,2,4-trimethylbenzene	NA	1.9 M	NA	2.3 M	2.9 M	4 M	3.4 M	9 M
1,3,5-trimethylbenzene	U	0.70 F	U	0.9 M	1.1 M	1.6 M	1.6 M	3.5 M
benzene	U	10	15	3.5 J	17	19 M	14	20
cis-1,2-dichloroethene	75	13	U	0.69 J	0.48 F	14 M	0.52 F	56
ethylbenzene	U	1 M	U	1.9 M	1.8 M	2.4 M	3 M	4 M
m,p-xylene (sum of isomers)	U	2.7 M	U	4.4 M	6.3 M	8.8 M	10 F	12 F
Naphthalene	NA	1.2 M	NA	1.9 M	1.2 M	1.4 M	1.8 M	1.6 M
o-xylene	U	1.1 M	U	1.6 M	1.9 M	2.8 M	4.9 M	3.3 M
tetrachloroethylene (pce)	U	U	U	U	U	U	U	U
toluene	60	5.5 M	13	5.1 M	12 M	18 M	64	28 M
trichloroethylene (tce)	11,000	110	2,300	430 J	220	11 M	180	2200
vinyl chloride	U	U	U	U	U	U	U	U

Notes:

U - Not detected.

F - The analyte was detected above the method detection limit (MDL), but below the reporting limit (RL).

J- The analyte was positvely identified, but the quantitation is an approximation.

M - A matrix effect was reported in the sample.

NA- Not Available

$\mu g/m^3$: microgram per cubic meter.

Exceedance of the indoor or outdoor initial benchmark.

Table 7
Building 786 AOC Detected Sub-slab Vapor Analytical Results (2006 and 2008)

Sample Location	**786SSV-1**		**786SSV-2**		**786SSV-3**	**786SSV-4**	**786SSV-5**	**786SSV-6**
Sample ID	**B786-SSV1**	**786SSV1BB**	**B786-SSV2**	**786SSV2BB**	**786SSV3BB**	**786SSV4BB**	**786SSV5BB**	**786SSV6BB**
Sample Type	**SSV**	**SSV**	**SSV**	**SSV**	**SSV**	**SSV**	**SSV**	**SSV**
Sample Date	**24-Oct-2006**	**18-Apr-2008**	**24-Oct-2006**	**18-Apr-2008**	**18-Apr-2008**	**18-Apr-2008**	**18-Apr-2008**	**18-Apr-2008**
Sample Depth (ft bgs)	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Sample Collection Duration (hr)	**8**	**12**	**8**	**12**	**12**	**12**	**12**	**12**
Volatiles (TO-15) in μg/m^3								
1,2,4-trimethylbenzene	NA	3.9 M	NA	4.8 M	4.5 M	4.2 M	170	4.8 M
1,3,5-trimethylbenzene	U	1.6	U	1.8 M	1.7 M	1.5 M	58	2 M
benzene	U	29	24 J	21	21	35	36 M	16
cis-1,2-dichloroethene	480	230	U	12	1.2 M	U	3.1 M	5.4
ethylbenzene	U	2.3 M	U	3.1 M	2.3 M	2.9 M	29 M	2.3 M
m,p-xylene (sum of isomers)	U	9 M	U	8.4 F	8.9 M	8.4 F	91 M	9.2 M
Naphthalene	NA	1.3 M	NA	2.1 M	2.6 M	1.2 M	27 M	1.5 M
o-xylene	U	3 M	U	3.9 M	2.8 M	3.8 M	57 M	3 M
tetrachloroethylene (pce)	2200	70	U	0.97 F	U	U	57 M	23
toluene	U	21	U	14	12	20	75 M	15
trichloroethylene (tce)	81,000	19,000 J	4,700 J	1,500	69	320	3,600	6,500 M
vinyl chloride	U	M	U	U	U	U	U	U

Notes:

U - Not detected.

F - The analyte was detected above the method detection limit (MDL), but below the reporting limit (RL).

J- The analyte was positvely identified, but the quantitation is an approximation.

M - A matrix effect was reported in the sample.

NA- Not Available

μg/m^3: microgram per cubic meter.

Exceedance of the indoor or outdoor initial benchmark.

of the Feasibility Study, the preferred alternative is Alternative 8, Directional Drilling and performance monitoring. The results of this evaluation are summarized below.

4 REMEDIAL ACTION OBJECTIVE

SVI mitigation by sub-slab depressurization will continue until the sources (groundwater contamination) have been remediated and sampling data shows sub-slab vapor chemical concentrations below 250 µg/m^3. Monitoring will continue once the sources have been remediated and sub-slab vapor chemical concentrations are between 50 to 250 µg/m^3. No further action will occur once the sources have been remediated and sub-slab vapor chemical concentrations are below 50 µg/m^3. SVI mitigation by sub-slab depressurization may be converted to a passive system with existing sources and sampling data shows sub-slab vapor chemical concentrations below 250 µg/m^3.

5 DESCRIPTION AND EVALUATION OF REMEDIAL ACTION ALTERNATIVES

The following 14 alternatives were developed for the SVI mitigation at SD-052-02 Building 775 Site [Buildings 774 and 776] and SD-052-01 Apron 2 Chlorinated Plume Site [Buildings 785 and 786].

- Alternative 1: No Further Action
- Alternative 2: Limited Action / LTM
- Alternative 3: Institutional Controls
- Alternative 4: Monitored Natural Attenuation
- Alternative 5: Horizontal Piping
- Alternative 6: Trenching
- Alternative 7: Sumps
- Alternative 8: Directional Drilling and Performance Monitoring
- Alternative 9: Vertical Piping
- Alternative 10: Passive Barrier
- Alternative 11: HVAC Manipulation
- Alternative 12: Carbon Treatment
- Alternative 13: Venting/Dilution
- Alternative 14: Demolition

Alternative 1: No Further Action –

This alternative involves no action for SVI mitigation. The source of the contamination would continue to migrate and naturally attenuate. No monitoring would be conducted to evaluate the progress of these natural processes.

Alternative 2: Limited Action / LTM –

The Limited Action involves the LTM of a specified duration or indefinite monitoring, as appropriate, to serve as an early warning system for the protection of potential receptors prior to completion of exposure pathways. No active measures would be conducted. Monitoring will be performed following a specified schedule of indoor, outdoor, sub-slab, and possibly soil vapors to determine the SVI potential. The monitoring data would be evaluated as it became available. For the sites, a comprehensive review of prior monitoring data would be conducted every five years to determine whether appropriate mitigation action should be considered at that time, or whether monitoring should be continued or discontinued, as needed.

Alternative 3: Institutional Controls –

This alternative consists of non-technical or legal controls that are implemented to reduce or prevent the potential for human exposure to contaminants and may include deed restrictions and other administrative land use controls such as zoning restrictions, or engineering controls such as access restrictions. Both sites are located within the former Griffiss AFB, and are industrial/commercial sites that are not intended for future residential use. All current and future receptors are therefore industrial/commercial workers and the sites are currently restricted to industrial/commercial use via deed/lease restrictions.

Alternative 4: Monitored Natural Attenuation –

Monitored natural attenuation would employ natural processes to reduce contaminant concentrations. It uses ongoing physical, chemical, and/or natural biological processes to reduce the contaminant concentrations, including biodegradation, abiotic degradation, sorption, volatilization, and dispersion. To implement monitored natural attenuation a fairly intensive field effort would be required to scientifically demonstrate that contaminants on the site are degrading at rates to be protective of human health and the environment.

Alternative 5: Horizontal Piping –

This alternative includes the installation of horizontal piping under the building slab and is used in conjunction with sub-slab depressurization. This piping can be either installed before the building foundation and slab are installed or, in the case of existing buildings, by installing underneath the existing slab (cutting through or directionally drilled). The piping will accumulate the sub-slab vapors, which then can be transported from under the slab either by passive venting or by active withdrawal under induced negative pressure.

Alternative 6: Trenching –

Trenching is a technology which includes the installation of trenches through the existing concrete slab to capture the sub-slab vapors in conjunction with sub-slab depressurization. The top of the trench will be sealed air-tight and there will be no concrete or other impermeable finish applied to the sides (below floor slab) and bottom of the trench, i.e., the sides and bottom are open to the subsurface soils to allow for vapor flow into the trench. The vapors are extracted through a pipe installed in the trench, either by passive venting or by active withdrawal under induced negative pressure. This technology can be implemented at any length, depth, and location within a building, and accurately completed. Existing trenches can also be used if they are of proper design and condition, and are suitably located.

Alternative 7: Sumps –

This alternative uses sumps to create a pathway for sub-slab vapor to evacuate from below the building slab. This technology is used in conjunction with sub-slab depressurization. The sump will essentially function as a large size vapor extraction well. The top opening of the sump will be closed air-tight and there will be no concrete or other impermeable finish applied to the sides (below floor slab) and bottom of the sump, i.e., the sides and bottom are open to the subsurface soils to allow for vapor flow into the sump. The vapors are extracted through a pipe installed in the sump, either by passive venting or by active withdrawal under induced negative pressure.

Alternative 8: Directional Drilling and Performance Monitoring –

With directional drilling a horizontal pipe is installed under the floor slab of a building by drilling from the outside. This technology is used in conjunction with sub-slab depressurization. The sub-slab vapors are removed from under the building through the installed directional piping, which is typically oriented in a generally horizontal direction, either by passive venting or by active withdrawal under induced negative pressure. The depth of installation depends on the existing utilities, foundations and soil characteristics. This technology has minimal impact on interior building activities. Directional drilling can be performed at virtually any building. Performance monitoring sampling would also be performed to confirm the effectiveness of the technology after it has been implemented.

Alternative 9: Vertical Piping –

Vertical piping is a technology which includes the installation of venting points vertically through the slab and is used in conjunction with sub-slab depressurization. The number of venting points depends on the size of the building, the area of influence of each venting point and the technology used during venting.

Alternative 10: Passive Barrier –

This alternative includes the installation of a passive barrier between the soil gas and the building envelope (indoor air). A concrete floor slab may provide partial protection as a passive barrier depending on its thickness and composition (admixtures), permeability, and integrity. Due to the inherent porosity of concrete, even under the best of conditions just described, a vapor barrier system consisting of the floor slab is often complemented by applying a vapor barrier coating (e.g., epoxy coating) on its surface inside the building. However, most if not all slabs are compromised (expansion joint, crack, sump, drain, etc.), which negates its task as passive barrier. Generally, a passive barrier in SVI mitigation refers to an applied material above or below the slab which is specifically applied to act as a barrier.

Alternative 11: HVAC Manipulation –

Heating, ventilation, and air conditioning (HVAC) Manipulation would consist of utilizing the current HVAC system installed in the buildings to create a positive pressure within the building envelope. This can be achieved by either physically changing parts of the system, changing the operation of the HVAC system, or both. The HVAC manipulation would prevent advective flow sub-slab vapor gases from entering the building by creating positive pressure within. Indoor air sampling would also be performed to confirm the effectiveness of the technology after it has been implemented, and periodic sampling of decreasing frequency would be performed to verify continued effectiveness.

Alternative 12: Carbon Treatment –

The carbon treatment alternative includes the installation of a carbon filter in the current HVAC system. The carbon adsorbs the COCs from the indoor air which is being circulated through the HVAC system.

Alternative 13: Venting/Dilution –

Venting entails the venting of a portion of the indoor air to the outside air. Since this will result in introducing fresh replacement air into the building, it effectively dilutes the COCs in the indoor air. To conserve energy (heating and cooling load energy, as well as energy for recirculation, which is a comparatively smaller component), the venting/ dilution rates are adjusted to minimum values required for reducing contaminant concentration in indoor air to below safe levels. This technology is typically accomplished actively (both mechanical and wind). A passive system may work in conditions where the required ventilation rate is of similar magnitude to the dilution air used as part of the normal HVAC system operation.

Alternative 14: Demolition –

This alternative involves the demolition and removal of all of the buildings structures, including above-ground structures and slab foundations. With all the associated building structures demolished, any potential receptor would also be removed. Slab removal would decrease sub-slab vapor accumulation.

6 EVALUATION CRITERIA FOR REMEDIAL ACTION ALTERNATIVES

The alternatives are developed with the goals of protecting human health and the environment and maintaining that protection over time, while at the same time minimizing and eliminating waste and disturbance to existing onsite operations to the extent feasible. Following the template provided in the EPA Guidance for Conducting RIs and FSs under CERCLA (EPA, October 1988), with modifications as needed and appropriate for the current project, the remedial alternatives were comparatively evaluated with respect to the following nine (9) criteria.

1. Overall protection of human health and the environment is a measure of how well the alternative reduces the potential for human exposure to contaminants, soil vapors from contaminated groundwater, and exposure of ecological receptors, in the short-term and long-term. It considers the following:
    - The net reduction in the toxicity, mobility, or volume of soil vapors from contaminated groundwater;

- The potential exposure pathway between humans or biota (considering future land use) and soil vapors from contaminated groundwater;
- The estimated quantity (amount and volume) of residual soil vapors from contaminated groundwater; and
- The potential exposure pathway between humans or biota and releases or emissions from the active response alternatives.

The preferred alternative will provide overall protection of human health and the environment. The contaminant vapors from the sub-surface are prevented from entering the interiors of the buildings, thus providing the best level of protection.

2. Compliance with health standards and any cleanup goals are a measure of how well the alternative meets the identified chemical, action, or location-specific applicable or relevant and appropriate requirements (ARARs) and to-be-considereds (TBCs) (federal, state and local) during the long-term and short-term.

   The preferred alternative will be in compliance with the remedial goals for the proposed remedial action and will achieve remedial action objectives. Performance monitoring will ensure that the proposed protective controls remain in place, that they remain protective, and that they are effective in preventing worker exposure to air contaminants inside the buildings.

3. Performance monitoring and permanence is a measure of how well the alternative meets the criteria of protecting human health/environment and meets the criteria of the ARARs and TBCs after implementation.

   The buildings are dedicated to non-residential industrial/office use and the workers in the buildings will be protected as long as the soil vapor extraction (SVE) system operates when the concentrations are high enough to warrant such a system, and will be protected indefinitely thereafter when the concentrations become low enough to switch to a passive mode of venting or the associated groundwater source is eliminated.

4. Reduction of toxicity, mobility, or volume through treatment considers the following:
   - The potential for the proposed treatment processes to achieve remedial action objectives;
   - The potential for its reversibility;
   - The amount of hazardous materials that will be destroyed or treated;
   - The degree of expected reduction in toxicity, mobility, or volume;
   - The type and quantity of residuals that will remain following treatment; and
   - Whether the alternative would satisfy the statutory preference for treatment as a principal element.

   Under the preferred alternative extracted vapors are adsorbed using granular activated carbon (GAC). The toxicity, mobility, and volume in indoor air will essentially be eliminated by preventing the subsurface vapors from entering the interior of the buildings, and the toxicity, mobility, and volume of subsurface contamination will be permanently reduced with time. Performance monitoring will periodically assess concentration levels of sub-surface contaminants and will register any reductions in their toxicity, mobility, and/or volume due to natural attenuation processes.

5. Short-term effectiveness is a measure of how well the alternative meets the criteria of protecting human health/environment, and meets the criteria of the ARARs and TBCs during implementation.

The buildings are dedicated to non-residential industrial/commercial use and the workers in the buildings will be protected during the implementation of this alternative, which involves operating an active venting system per design requirements. SVE, which is an established remediation technology, will be designed to effectively remove potential source contamination during the implementation of the alternative. The proposed monitoring system will provide data for verifying the effectiveness of the alternative during its implementation, and for making any adjustments to the operating parameters for continued effectiveness during the entire duration of its implementation.

6. Implementability is a measure of whether an alternative can be physically and administratively implemented, such as the ability to construct, install, or operate. It is also a measure of the availability of the services and materials needed to implement the alternative. Although state and community acceptance are listed separately among the alternatives evaluation criteria, they are also given consideration in the context of evaluations for implementability.

   The preferred alternative measures high on technical feasibility due to the ease of implementing the proposed alternative and related future actions, and the ability to monitor its effectiveness with a well-designed performance monitoring program. The interiors of the buildings will not be disturbed. Field adjustments may need to be made to the design during drilling stage if any underground obstructions are encountered. It also ranks high on administrative implementability since it satisfies the Air Force intent to undertake remedial action. Professional services and materials are easily and competitively available for implementing the alternative during the construction and operation phases and for implementing the performance monitoring program.
7. Cost is a measure of the overall investment (dollars) to implement the alternative with consideration of the benefit of that investment to the public and site.

   The estimated 5-year total cost for the preferred alternative at the Buildings 774 and 776 Site is $630,000, total. The estimated 5-year total cost for the Buildings 785 and 786 Site is $660,000, total.

The following criteria are considered fully after the formal public comment period on the proposed plan is complete:

8. State acceptance indicates whether, based on its review of the proposed plan and FS reports, the State supports or opposes the preferred alternative and/or has identified any reservations with respect to the preferred alternative.
9. Community acceptance refers to the public's general response to the alternatives described in the proposed plan and the FS report. Factors of community acceptance include support, reservation, or opposition by the community.

Under Alternatives 1, 2, 3, and 4, no actions would be taken to mitigate SVI. These alternatives represent the least expensive options. However, treatment technologies would not be implemented and would not address potential long-term health concerns even when contaminant vapor concentrations are low. These alternatives would not be effective in achieving the desired goals of the project in a finite time scale.

Alternatives 5, 6, 7, 8, and 9 are all associated with sub-slab depressurization via different methodologies. However, when considering implementing these technologies to an occupied building (e.g. Buildings 774 and 776) alternatives 5, 6, 7, and 9 are not feasible. Alternative 8

(SVI mitigation by horizontal wells (horizontal drilling) with performance monitoring) is the only technically and administratively implementable option associated with these technologies for the occupied buildings since there would be no disturbance to daily business activities during construction or operation.

Under Alternative 10, a passive barrier would be installed. While the overall effectiveness of a well installed passive barrier is good, the integrity can become an issue if building activities compromise or degrade the epoxy coating or if building renovations unintentionally puncture the geomembrane below the slab, requiring more administrative controls to avoid such occurrences. The implementability of epoxy coating is good in unoccupied or lightly used buildings, especially when buildings have open floor plans. On the contrary, implementability is limited or very costly in buildings which are highly divided or finished with tile, carpet, or wood floors, all of which are found in Buildings 774 and 776.

Alternatives 11 and 12 require functioning HVAC systems. These alternatives are viable for Buildings 774 and 776 with moderate costs and good technical and administrative implementability. However, these alternatives are not a feasible option for Buildings 785 and 786 which currently do not have functioning HVAC systems.

Alternative 13 is a good option for Buildings 785 and 786, because both buildings have large bay doors which are continuously open, many holes in the metal walls of the buildings, and many broken or open windows in both buildings. Natural venting/dilution via open doors and windows is not an option for Buildings 774 and 776, because both buildings have active HVAC systems and no or few windows that can open. Moreover, building occupants are high-security computer firms working with classified information and are under tight security. Open doors and windows are not allowed. However, venting/dilution through increased outside air exchange rates in the HVAC system is a viable option for Buildings 774 and 776.

Under Alternative 14 the building structure would be demolished. While the effectiveness is good because the demolition and removal of the building will effectively remove any potential receptors, all four buildings are currently used and/or occupied.

Based on the comparative analysis of remedial alternatives, according to established criteria, the recommended alternative for Buildings 774 and 776 is Alternative 8 – SVI mitigation by horizontal wells (horizontal drilling) with performance monitoring. This alternative is also the recommended alternative for Buildings 785 and 786. Horizontal drilling with performance monitoring represents an active remedial approach to mitigate SVI of COCs at each site and also provides for the protection of human health and the environment. Although the installation of this alternative is not the least expensive, it is a proven and effective way to mitigate SVI.

7 RISK-BASED SCREENING LEVEL EVALUATION

As part of the evaluation process of mitigatory actions for the sites, a risk-based screening level evaluation was completed in May 2011 (FPM Group, Ltd., May 2011). The evaluation was conducted using the SVI sampling results from the 2006 and 2008 events. The purpose of the evaluation was to determine the quantitative risk-based screening levels for indoor air and sub-slab vapor for volatile COCs and to propose a site-specific approach for the evaluation of indoor air, sub-slab, and groundwater monitoring results at Buildings 774, 776, 785 and 786. The evaluation has been updated since 2011 to follow the current EPA Regional Screening Levels (RSL) (May 2013). The following discusses the updated evaluation.

7.1 Risk-Based Screening Levels for Indoor Air

Human health risk-based screening concentrations for inhalation of indoor air for an industrial/commercial and residential scenario are identified as the current EPA RSL (May 2013) for indoor air available at http://www.epa.gov/region9/superfund/prg/.

7.2 Risk-Based Screening Levels for Sub-Slab Vapor

Sub-slab vapor screening levels were derived from the RSLs using a sub-slab vapor-to-indoor air attenuation factor ($AF_{s/ia}$). The $AF_{s/ia}$ represents the ratio of the indoor air concentration measured in a structure to the vapor concentrations measured in the subsurface materials underlying the structure. Site-specific $AF_{s/ia}$ values were estimated based on (1) observed attenuation at the buildings (i.e., indoor air and sub-slab vapor data), (2) EPA recommended values, and (3) building construction and use.

7.3 Site-Specific Screening Levels

Sub-slab vapor screening levels based on industrial/commercial and residential RSLs for indoor air at a site specific target risk of 1E-05 or target HQ of 1 are shown in Table 8.

8 INTERIM REMEDIAL ACTION

8.1 SD-052-02 Building 775 Site [Buildings 774 and 776]

Based on the findings of the FS, a sub-slab vapor mitigation (SSVM) system was installed at SD-052-02 Building 775 Site [Buildings 774 and 776] in spring 2011 as an interim remedial action (FPM Remediations Inc., February 2013). The system is composed of four horizontal wells as shown in Figure 4.

8.1.1 SSVM System Components

Initially, for this SSVM design, three horizontal wells were installed. The two horizontal wells in Building 774 (774SSVM-1 and -2) were constructed of a 80 ft screen at a depth of 6 ft and 8 ft bgs, respectively, of 0.010-slot size, 4-inch diameter Schedule 80 poly vinyl chloride (PVC). The wells were installed March 14 through April 14, 2011, using a horizontal directional drilling pull method. An additional horizontal well (774SSVM-3) was installed using a pneumatic bullet on October 14, 2011 to compensate for underperformance of 774SSVM-2. 774SSVM-3 was constructed of a 20 ft screen at a depth of 6 ft bgs, of 0.010-slot size, 2-inch diameter Schedule 40 PVC. This smaller well (774SSVM-3) operates together with the larger well (774SSVM-2) to achieve maximum influence in the southwestern corner of Building 774 where insufficient well flow and sub-surface response had minimized system effectiveness.

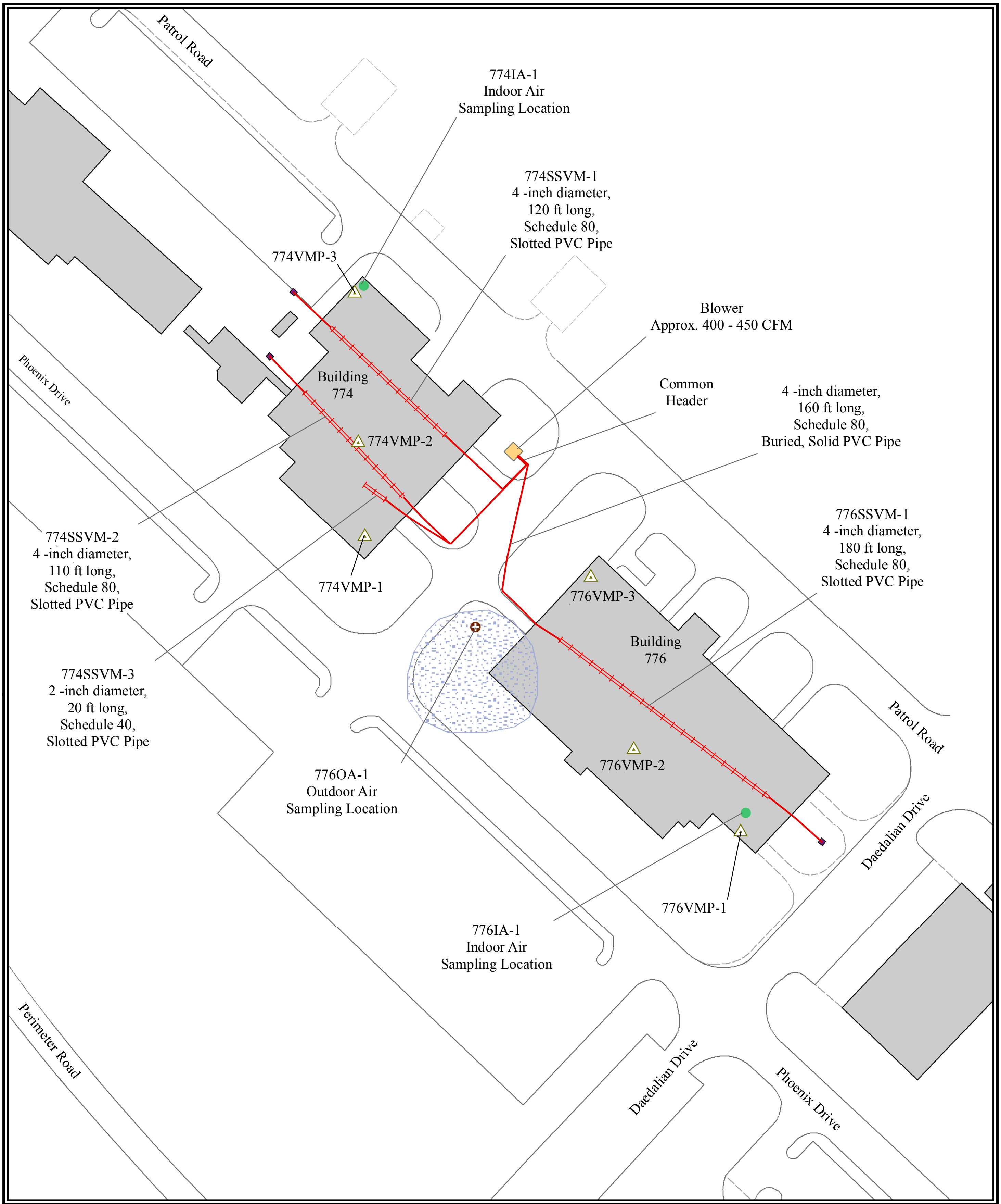
Table 8
Buildings 774, 776, 785, and 786 Sub-slab Vapor Screening Levels

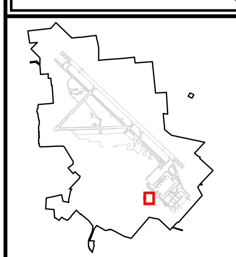
COC	Industrial Air RSL[a] (μg/m^3)	Industrial Sub-Slab Vapor Screening Level (μg/m^3)	
	TR = 1E-05	Buildings 774 and 776 ($AF_{s/ia}$ = 0.1)	Buildings 785 and 786 ($AF_{s/ia}$ = 0.01)
Benzene	16 (c)	160	1600
cis-1,2-Dichloroethylene	35[b] (n)	350	3500
Ethylbenzene	49 (c)	490	4900
Naphthalene	3.6 (c)	36	360
Tetrachloroethylene	21 (c)	210	2100
Toluene	22000 (n)	220000	2200000
Trichloroethylene	61 (c)	610	6100
1,2,4-Trimethylbenzene	31 (n)	310	3100
1,3,5-Trimethylbenzene	--	--	--
p-Xylene	3100 (n)	31000	310000
m-Xylene	3100 (n)	31000	310000
o-Xylene	3100 (n)	31000	310000

[a]Industrial RSL is the smaller (most protective) of the values calculated for the cancer or non-cancer endpoint at a target cancer risk of 1E-05 and a target hazard quotient of 1. RSLs corresponding to the noted cancer risk are indicated by (c). RSLs corresponding to a hazard index of 1 are indicated by (n).

[b]No current approved toxicity values are available to calculate an RSL. Value is the indoor air screening value published in Table 2c of *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils* (EPA 2002)

COC = Contaminant of Concern
RSL = EPA Regional Screening Level
TR = Target Risk
-- = no value available





Site Location

Key to Features

- Indoor
- Outdoor
- SubSlab Vapor
- Horizontal Well Screen
- Horizontal Well Riser
- Demolished Road
- Existing Road
- TCE 50 µg/L October 2010
- SVE System
- Entrance/Exit Pit
- Demolished Facility
- Existing Facility

Figure 4
Buildings 774 and 776
SSVM System Layout

N

0 50 100 200

Feet

UNITED STATES AIR FORCE
GRIFFISS AIR FORCE BASE
ROME, NEW YORK

FPM Remediations, Inc

Y:\GIS_Projects\Griffiss\Projects\1015-11-01\SVI\SVI Proposed Plan\Figure 4.mxd

The horizontal well in Building 776 (776SSVM-1) was constructed of a 180 ft screen at a depth of 7 ft bgs, of 0.010-slot size, 4-inch diameter Schedule 80 PVC. The well was installed March 14 through April 14, 2011, using directional drilling pull method.

The horizontal extraction wells (774SSVM-1, -2, -3 and 776SSVM-1) were connected in line with a regenerative blower, including all blower components. The blower model is capable of achieving a maximum flow rate of 600 standard cubic feet per minute (scfm) and a maximum vacuum of 106 inches of water gauge (in w.g.). Blower components included control panel, vacuum relief valve, air dilution valve with filter, vacuum and temperature gauges, flow meter, in line filter, muffler, and 50 gallon moisture knockout tank.

The regenerative blower was connected in line with a vapor-after-treatment system comprising of two air purification canisters each containing GAC. The GAC was used to remove chlorinated solvents in the vapor phase. The calculated life span of GAC is approximately 2 months.

8.1.2 Vapor Monitoring Points

The sub-slab vapor monitoring points (VMPs) were strategically placed to monitor effective Radius of Influence (ROI) and vapor transport and mitigation. In Building 774, three sub-slab VMPs were installed, 774VMP-1, -2, and -3 which contain one interval less than a foot beneath the sub-slab. 774VMP-1 is located 30 ft off axis of horizontal well 774SSVM-2 and approximately 25 ft off axis of horizontal well 774SSVM-3 (installed in November 2011), at the beginning of the well screen. 774VMP-2 is located in-between horizontal well 774SSVM-1 and -2, at approximately 15 ft off axis, in the middle of the well screen. 774VMP-3 is located 45 ft off axis of horizontal well 774SSVM-1, at the end of the well screen. Building 776 also has three sub-slab VMPs, 776VMP-1, -2 and -3. These VMPs are located 30 ft off axis at the end of the well screen, 35 ft off axis in the middle of the well screen, and 45 ft off axis at the beginning of the well screen, respectively. All VMPs are illustrated on Figure 4.

8.1.3 Performance Evaluation –

8.1.3.1 Stepped Rate Test

Stepped rate tests were performed on June 3, 2011 and November 11, 2011 to determine the relationship between applied vacuum and the resulting flow rate from an extraction well. The results of the initial stepped rate test were as follows:

- 774SSVM-1 flow rates ranged from 99 actual cubic feet per minute (acfm) to 156.5 acfm and vacuum ranged from 11 in w.g. to 17 in w.g.
- 774SSVM-2 flow rate was 0 acfm and vacuum ranged from 12 in w.g. to 18 in w.g.
- 776SSVM-1 flow rates ranged from 141.3 acfm to 210 acfm and vacuum ranged from 10 in w.g. to 16 in w.g.

Due to horizontal well 774SSVM-2 observed underperformance in flow rate (0 acfm), an additional horizontal well 774SSVM-3 was installed. The stepped rate test was then re-performed with the additional horizontal well 774SSVM-3 on November 11, 2011. The results of the test where all four horizontal wells were tested simultaneously with fully opened valves showed:

- 774SSVM-1 flow rates ranged from 98.8 acfm to 182.8 acfm and vacuum ranged from 17 in w.g. to 28 in w.g.
- 774SSVM-2, and -3 combined flow rates ranged from 31.2 acfm to 69.2 acfm and vacuum ranged from 12 in w.g. to 22 in w.g.
- 776SSVM-1 flow rates ranged from 120.8 acfm to 188.5 acfm and vacuum ranged from 19 in w.g. to 31 in w.g.

The results of the re-performed stepped rate test show an increase in vacuum for all wells, and an increase in flow rate for 774SSVM-1, as well as an increase in flow rate for 774SSVM-2 combined with the new horizontal well, 774SSVM-3. Horizontal well 776SSVM-1 showed a decrease in flow rate, likely attributed to a balanced total flow rate of the system.

8.1.3.2 Vacuum Radius of Influence Test

The ROI test was performed on 774SSVM-1, -2 and 776SSVM-1 on June 6, 2011. The ROI test in Building 774 did not show sufficient vacuum at VMPs, 774VMP-1 and -3. 774VMP-1 is located next to the underperforming well 774SSVM-2. After the additional horizontal well was installed (774SSVM-3), vacuum measurement was observed in 774VMP-1 at 0.2 in w.g., which is a sufficient vacuum. For 774VMP-3, it has been determined that vacuum measurements are insufficient at this point because it is the worst case scenario installed at the end of the 774SSVM-1 well screen with the greatest distant off axis. This point was reinstalled to ensure it was working properly. When the VMP was reinstalled, it was drilled 6 inches deeper. A vacuum measurement was recorded once the new VMP was completed at 0.05 in w.g. This measurement is half the recommended sufficient vacuum.

The ROI test in Building 776 did not show sufficient vacuum at 776VMP-2. This point is 35 ft off the middle of the well axis, and is not the worst case scenario. Therefore, it is assumed that the structural foundation and/or preferential paths are restricting vacuum in this location. Sufficient vacuum was observed at the other VMPs.

8.1.3.3 Baseline and Start-up Vapor Monitoring Point Sub-Slab Sampling

The screening levels used for the performance evaluation were established by the Air Force (FPM Group, Ltd., October 2007). A baseline sample was collected prior to SSVM system start-up at each newly installed VMP location. The baseline sampling event was on May 4, 2011 with results of TCE above the sub-slab vapor screening level at 774VMP-1, -2, and 776VMP-3 (580 $\mu g/m^3$, 2,900 $\mu g/m^3$, and 830 $\mu g/m^3$, respectively). 774VMP-3, 776VMP-1 and -2 had results for TCE below sub-slab vapor screening levels (300 $\mu g/m^3$, 21 $\mu g/m^3$, and 360 $\mu g/m^3$, respectively).

In addition to sub-slab sampling, indoor and outdoor air quality samples were also collected. The indoor air results in Building 774 for TCE was 4.4 $\mu g/m^3$, and the indoor air results in

Building 776 for TCE was 3.6 µg/m^3, where both results are below 2007 screening levels. One outdoor air sampled was collected between the two buildings where the result for TCE was 0.98 µg/m^3.

The 774SSVM-1, -2 and 776SSVM-1 extraction wells began consistent operation on June 6, 2011 following the ROI test. The system operated for 3 months and was turned off for sampling evaluation. The sampling event occurred on August 24, 2011 in Building 774 and on September 6, 2011 in Building 776. The results indicated a decreasing trend where the only VMP above screening level was 774VMP-1 for TCE at 410 µg/m^3. This VMP is located next to the underperforming well 774SSVM-2. The remaining VMPs were below screening levels, 774VMP-2 and -3 TCE concentrations were at 84 µg/m^3, and 11 µg/m^3, respectively, and 776VMP-1, -2 and -3 TCE concentrations were at 38 µg/m^3, 3.8 µg/m^3, and 10 µg/m^3, respectively.

Indoor and outdoor air quality sampling was also conducted on September 6, 2011. Building 774 was below TCE screening levels at 2.3 µg/m^3, and Building 776 was below TCE screening levels at 1.9 µg/m^3. The outdoor air quality sample collected between the two buildings had detection for TCE at 2.6 µg/m^3.

The system was shut down again after 5 months of operation and a sampling event took place on October 21, 2011 to evaluate the performance of the newly installed horizontal well (774SSVM-3), which had been in operation for one week, and to evaluate overall vapor mitigation at the site. This event resulted in all VMPs below screening levels. 774VMP-1, -2 and -3 had TCE concentrations at 3.7 µg/m^3, 11 µg/m^3, and 3.0 µg/m^3, respectively. 776VMP-1, -2, and -3 had TCE concentrations at non-detected, 3.7 µg/m^3, and 7.3 µg/m^3, respectively.

Indoor and outdoor air quality sampling was also conducted on October 21, 2011. Building 774 was below TCE screening levels at 0.87 µg/m^3, and Building 776 was below TCE screening levels at 0.98 µg/m^3. The outdoor air quality sample collected between the two buildings had detection for TCE at 0.60 F µg/m^3. All sub-slab vapor, indoor air, and outdoor air sampling results are presented in Table 9.

8.1.3.4 Influent Vapor Sampling

The effectiveness of the horizontal extraction wells at removing soil gas vapors from the sub-surface is evaluated based on influent sampling. An influent sample was collected during the initial startup of 774SSVM-1, -2 and 776SSVM-1 extraction wells, on June 6, 2011, where the sample was grabbed before GAC treatment. The influent resulted in a TCE concentration of 510 µg/m^3. For the 3 month sampling event, an influent sample was collected. The influent TCE concentration was 240 µg/m^3.

After the installment of horizontal well 774SSVM-3, two influent samples were collected on October 14, 2011 to evaluate vapor extraction of the newly installed well. The first sample collected was without 774SSVM-3 influence (valve closed) and the second sample collected was with 774SSVM-3 influence. Detected TCE concentrations were 670 µg/m^3, and 1,200 µg/m^3, respectively. Sampling was also performed to see if the method used for horizontal well

Table 9
Building 774 and 776 SSVM Performance Monitoring
Sub-Slab Vapor, Indoor Air, and Outdoor Air Results

Building 774 VMPs

Sample Location	774VMP-1					774VMP-2					774VMP-3				
Sample Date	**5/4/11**	**8/24/11**	**10/21/11**	**1/25/12**	**8/6/12**	**5/4/11**	**8/24/11**	**10/21/11**	**1/25/12**	**8/6/12**	**5/4/11**	**8/24/11**	**10/21/11**	**1/26/12**	**8/6/12**
Sample Collection Duration (hr)	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**
Volatiles (TO-15) in µg/m^3															
1,2,4-trimethylbenzene	6.7	3.2	U	12	1.8	12	4	0.65 F	6.0 F	1.7	6.3	4.1	0.95	U	0.35 F
1,3,5-trimethylbenzene	2.5	0.9	U	3.2 F	0.47 F	3.9	2	U	U	0.43 F	2.2	1.8	U	U	U
benzene	1.6	4.3	U	U	0.44 F	6	4.4	U	U	0.53 F	2.5	3.8	0.39 F	U	0.38 F
cis-1,2-dichloroethene	0.89	0.77	U	U	U	0.73	U	U	U	U	U	U	U	U	U
ethylbenzene	1.4	2.8	U	4.1 F	0.95	1.6	3.2	U	1.9 F	0.94	1.5	3.6	U	U	0.45 F
m,p-xylene (sum of isomers)	5.3	9	U	12 D	3.1	5.1	12	0.53 F	5.5 F	3.1	4.5	12	1.2 F	U	1.2 F
naphthalene	U	U	U	U	0.60 F	U	U	U	U	1.9 F	U	U	U	U	0.68 F
o-xylene	2.4	2.4	U	7.9 D	1.2	2.2	2.8	U	3.6 F	1.1	2.2	3.2	U	U	0.38 F
tetrachloroethylene (pce)	0.97 F	1	U	U	U	2.8	U	U	U	U	U	U	U	U	U
toluene	1.6	17	2.1	5.2	4.2	3.2	17	1.4	4.8 F	3.9	2.3	16	2.2	1.3 F	4.0
trichloroethylene (tce)	580	410	3.7	4.8 F	1.0 F	2,900	84	11	4.2 F	20	300	11	3.0	U	1.0 F
vinyl chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

Building 776 VMPs

Sample Location	776VMP-1					776VMP-2					776VMP-3				
Sample Date	**5/4/11**	**9/6/11**	**10/21/11**	**1/25/12**	**8/6/12**	**5/4/11**	**9/6/11**	**10/21/11**	**1/25/12**	**8/6/12**	**5/4/11**	**9/6/11**	**10/21/11**	**1/25/12**	**8/6/12**
Sample Collection Duration (hr)	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**
Volatiles (TO-15) in µg/m^3															
1,2,4-trimethylbenzene	9.0	3.5	U	U	0.46 F	9.1	3.3	0.65 F	U	0.45 F	11	2.1	0.50 F	0.61 F	0.52 F
1,3,5-trimethylbenzene	3.8	1.6	U	U	U	2.8	1.2	U	U	U	2.7	0.70 F	U	U	U
benzene	1.0	0.55	1.3	0.52 F	0.43 F	1.1	0.45 F	1.5	0.65	0.43 F	2	0.39 F	1.0	0.40 F	0.32 F
cis-1,2-dichloroethene	U	9.70	U	U	U	U	U	U	U	U	U	U	U	U	U
ethylbenzene	1.6	0.79	1.6	U	0.92	0.66	0.88	1.4	0.75 F	1.1	1.1	0.66	1.2	0.64 F	0.72 F
m,p-xylene (sum of isomers)	5.4	1.9	4.0	0.23 F	1.8 F	2.1	2.4	3.4	1.9 F	2.4	3.8	1.7	2.7	1.7 F	1.7 F
naphthalene	U	U	U	U	3.2 F	U	U	U	U	1.9 F	U	U	U	0.51 F	1.6 F
o-xylene	2.5	0.97	1.1	U	0.65 F	1.1	0.93	0.97	0.79 F	0.82 F	1.6	0.66	0.71	0.70 F	0.58 F
tetrachloroethylene (pce)	U	2.7	U	U	U	1.4	U	7.4	U	U	0.83 F	U	U	U	U
toluene	5.6	4.1	6.1	0.40 F	1.5	3.2	4.5	6.9	1.4	1.7	4.4	3.1	2.5	1.2	1.8
trichloroethylene (tce)	21	38	U	0.36 F	U	360	3.8	3.7	3.0	1.4	830	10	7.3	13	12
vinyl chloride	U	0.81	U	U	U	U	U	U	U	U	U	U	U	U	U

Building 774 and 776 Indoor and Outdoor

Sample Location	774-IA					776-IA					774/776-OA				
Sample Date	**5/5/11**	**9/6/11**	**10/21/11**	**1/25/12**	**8/6/12**	**5/4/11**	**9/6/11**	**10/21/11**	**1/25/12**	**8/6/12**	**5/4/11**	**9/6/11**	**10/21/11**	**1/25/12**	**8/6/12**
Sample Collection Duration (hr)	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**
Volatiles (TO-15) in µg/m^3															
1,2,4-trimethylbenzene	2.7	1.6	0.65 F	U	U	1.2	1.7	0.85	U	0.55 F	U	1.7	0.60 F	U	1.8
1,3,5-trimethylbenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.51 F
benzene	1.3	U	U	U	U	0.49	0.36 F	1.4	0.67 F	0.40 F	U	0.39 F	U	0.63	0.92 F
cis-1,2-dichloroethene	U	U	U	U	U	U	U	U	U	U	U	0.48 F	U	U	U
ethylbenzene	0.84	0.57 F	U	U	U	0.71	0.93	1.3	0.47 F	1.1	U	U	1.1	U	2.1
m,p-xylene (sum of isomers)	2.4	1.2 F	0.57 F	U	U	1.2 F	2.1	2.9	1.0 F	2.5	U	1.1 F	2.7	0.33 F	6.2
naphthalene	U	U	U	U	U	U	U	U	0.71 F	2.2 F	U	U	U	U	3.1 F
o-xylene	0.71	0.49 F	U	U	U	0.44 F	0.75	0.88	0.46 F	0.81 F	U	0.44 F	0.97	0.12 F	2.2
tetrachloroethylene (pce)	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
toluene	5.1	2.5	1.3	0.76 F	0.47 F	4.4	3.2	3.9	1.3	5.3	1	5.8	3.5	0.73 F	20
trichloroethylene (tce)	4.4	2.3	0.87	1.5 F	0.35 F	3.6	1.9	0.98	0.41 F	U	0.98	2.6	0.60 F	U	U
vinyl chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

Notes:
U - Not detected.
F- Analyte detectd at or below quantitation limits
NA- Not Available
µg/m^3: microgram per cubic meter.
Exceedance of the indoor or outdoor initial benchmark.

installment (pneumatic bullet with oil for lubrication) had any effect on vapor concentrations. Vapor concentrations which were higher than the previous sampling rounds included acetone (300 $\mu g/m^3$, and 440 $\mu g/m^3$, respectively), methyl ethyl ketone from PVC cement (300 $\mu g/m^3$, and 400 $\mu g/m^3$, respectively) and tetrahydrofuran from PVC cement (600 $\mu g/m^3$, and 770 $\mu g/m^3$, respectively).

After 5 months of system operation, sampling occurred on October 25, 2011. The influent sample TCE concentration was 650 $\mu g/m^3$.

The influent air sampling results are presented in Table 10.

8.1.4 Ongoing Operations and Maintenance - Building 774 and 776

The Building 774 and 776 SSVM system has operated since June 2011. Operation and Maintenance (O&M) includes weekly system component readings (system temperature, flow, vacuum and motor status), semi-annual VMP vacuum measurements, and GAC disposal and replacement every two months. Indoor and outdoor air sampling, sub-slab vapor sampling, and influent sampling are conducted semi-annually during the heating and cooling months (FPM Remediations Inc., February 2014). The two latest sampling events are described below.

Sub-slab vapor, indoor and outdoor air sampling occurred at Buildings 774 and 776 on February 21, 2013. The highest sub-slab vapor and indoor air TCE concentrations that were detected are provided below. TCE was not detected in the outdoor air between Buildings 774 and 776 or the indoor air sample at Building 776.

- Building 774 - TCE concentration: 1.3 F $\mu g/m^3$ at location 774VMP-3, and
- Building 776 - TCE concentration: 2.4 $\mu g/m^3$ at location 776VMP-3.
- Building 774 - TCE concentration: 0.22 F $\mu g/m^3$ in the indoor air,

Semi-annual influent sampling occurred on February 15, 2013, prior to sub-slab vapor sampling to determine effective SVE. Influent results at Buildings 774 and 776 for TCE were 20 $\mu g/m^{\mathbf{3}}$.

Sub-slab vapor, indoor and outdoor air sampling occurred at Building 774 on August 8, 2013, and at Building 776 on August 8 and 9, 2013. The highest sub-slab vapor TCE concentrations that were detected are provided below. TCE was not detected in the indoor air or outdoor air samples at Building 774 and 776.

- Building 774 - TCE concentration: 0.33 F $\mu g/m^3$ at location 774VMP-3, and
- Building 776 - TCE concentration: 0.20 F $\mu g/m^3$ at location 776VMP-2.

Semi-annual influent sampling occurred on August 7, 2013, prior to sub-slab vapor sampling to determine effective SVE. Influent results at Buildings 774 and 776 for TCE were 120 $\mu g/m^3$.

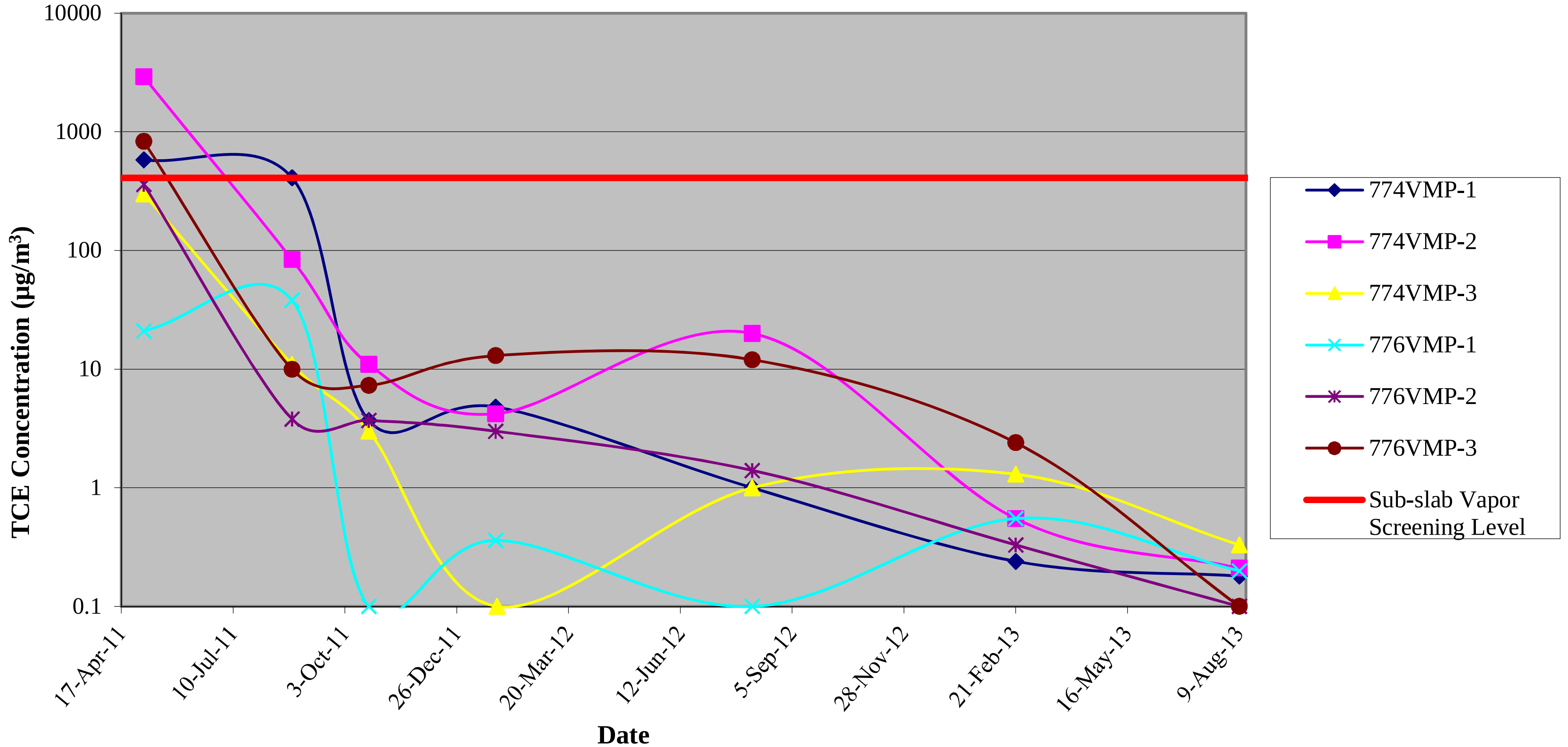
All sub-slab vapor, indoor air, and outdoor air sampling results are presented in Table 9 and influent air sampling results are presented in Table 10. Figure 5 shows the trend for sub-slab results at Buildings 774 and 776 since the start-up of the SSVM system.

Table 10
Buildings 774 and 776
SSVM Performance Monitoring Influent Air Results

Sample Location	**774776- Influent**						
Sample Date	**6-Jun-2011**	**23-Aug-2011**	**14-Oct-2011**	**14-Oct-2011**	**25-Oct-2011**	**24-Jan-2012**	**3-Aug-2012**
Volatiles (TO-15) in µg/m^3							
1,2,4-trimethylbenzene	9.5	3.1	U	U	1.7	U	0.69 F
1,3,5-trimethylbenzene	4.7	2.2	U	U	0.55 F	U	U
benzene	0.45 F	4.1	0.42 F	0.7	0.97	1.8 F	0.30 F
cis-1,2-dichloroethene	1.80	U	U	U	U	U	U
ethylbenzene	0.62 F	0.93	U	U	0.79	U	0.38 F
m,p-xylene (sum of isomers)	1.3 F	3.3	U	U	2.4	U	0.99 F
naphthalene	U	U	U	U	U	U	1.9 F
o-xylene	0.84	1.8	U	U	1.0	U	0.42 F
tetrachloroethylene (pce)	3.4	2.4	2.3	12	3.5	U	1.5
toluene	1.8	2.2	0.96	1.4	2.2	0.83 F	1.2
trichloroethylene (tce)	510	240	670	1,200	650	300	190
vinyl chloride	U	U	U	U	U	U	U

Notes:
U - Not detected.
F- Analyte detectd at or below quantitation limits.
NA- Not Available
µg/m^3: microgram per cubic meter.
Exceedance of the indoor or outdoor initial benchmark.
B - Analytes detected in the trip blank.

Figure 5
Sub-Slab TCE Trend Chart for Buildings 774 and 776
(May 2011 through September 2013)



Note: Not detected results are plotted as 0.10 µg/m³.

All of the O&M sub-slab sampling results were below vapor screening levels. All indoor and outdoor air concentrations were within an acceptable range and did not pose any unacceptable risk to building occupants.

8.2 SD-052-01 Apron 2 Chlorinated Plume Site [Buildings 785 and 786]

Based on the findings of the FS, a SSVM system was installed at SD-052-01 Apron 2 Chlorinated Plume Site [Buildings 785 and 786] in Winter and Spring 2011 as an interim remedial action. The system is comprised on two horizontal wells as shown is Figure 6.

8.2.1 SSVM System Components

The Building 785 and 786 system is composed of two horizontal wells with a total combined screen length of 300 ft performing under a flow rate of 1 acfm per foot of screen. The horizontal well in Building 786 (786SSVM-1) was constructed of a 160 ft screen at a depth of 10 ft bgs, of 0.010-slot size, 3-inch diameter Schedule 40 PVC. The well was installed November 15 through November 23, 2010, using directional drilling pull method. Horizontal well 786SSVM-1 was installed as part of the pilot study and was also discussed in the Pilot Study Report (FPM Remediations Inc., May 2011). The horizontal well in Building 785 (785SSVM-1) was constructed of a 140 ft screen at a depth of 8 ft bgs, of 0.010-slot size, 3-inch diameter Schedule 40 PVC. The well was installed February 15 through 28, 2011, using directional drilling pull method.

The horizontal extraction wells (785SSVM-1 and 786SSVM-1) are connected in line with a regenerative blower, including all blower components. The blower model is capable of achieving a maximum flow rate of 420 scfm and a maximum vacuum of 110 in w.g. Blower components included control panel, vacuum relief valve, air dilution valve with filter, vacuum and temperature gauges, flow meter, in line filter, muffler, and 60 gallon moisture knockout tank.

The regenerative blower was connected in line with a vapor-after-treatment system comprising of two air purification canisters each containing 140 pounds of GAC. The GAC was used to remove chlorinated solvents in the vapor phase. The calculated life span of GAC is approximately 2 months.

8.2.2 Vapor Monitoring Points

The VMPs for Building 786, installed during the pilot study and documented in the Pilot Study Report (FPM Remediations Inc., May 2011), were strategically placed on January 13 through 14, 2011, to assist the ROI test, where 786VMP-1, -2 and -3 were respectively 15 ft, 30 ft and 45 ft off the 786SSVM-1 well axis with design placement considering the middle of the well screen, beginning of the well screen and end of the well screen, respectively. The VMPs contain three intervals of depth, a shallow (2 to 2.5 ft bgs), a medium (5 to 5.5 ft bgs) and a deep (10 to 10.5 ft bgs). Building 785 utilized one existing VMP installed during the pilot study, 785VMP-2. This VMP is located 15 ft off axis at the beginning of the well screen. The VMP contains three intervals of depth, a shallow (2 to 2.5 ft bgs), a medium (5 to 5.5 ft bgs) and a deep (10 to 10.5 ft bgs). Two additional sub-slab VMPs were installed to assist the full scale SSVM design.

785VMP-4 and 785VMP-5 were installed 30 ft and 60 ft off axis, in the middle and the end of the well screen, respectively. The sub-slab VMPs contains one interval less than 1 foot beneath the sub-slab. The VMPs are illustrated on Figure 6.

8.2.3 Performance Evaluation

8.2.3.1 Stepped Rate Test

The stepped rate test was performed on May 18, 2011. The results of the stepped rate test were as follows:

- 785SSVM-1 flow rate ranged from 80.4 acfm to 111.2 acfm and vacuum ranged from 24 in w.g. to 43 in w.g.
- 786SSVM-1 flow rate ranged from 80.9 acfm to 124.6 acfm and vacuum ranged from 22 in w.g. to 41 in w.g.

8.2.3.2 Vacuum Radius of Influence Test

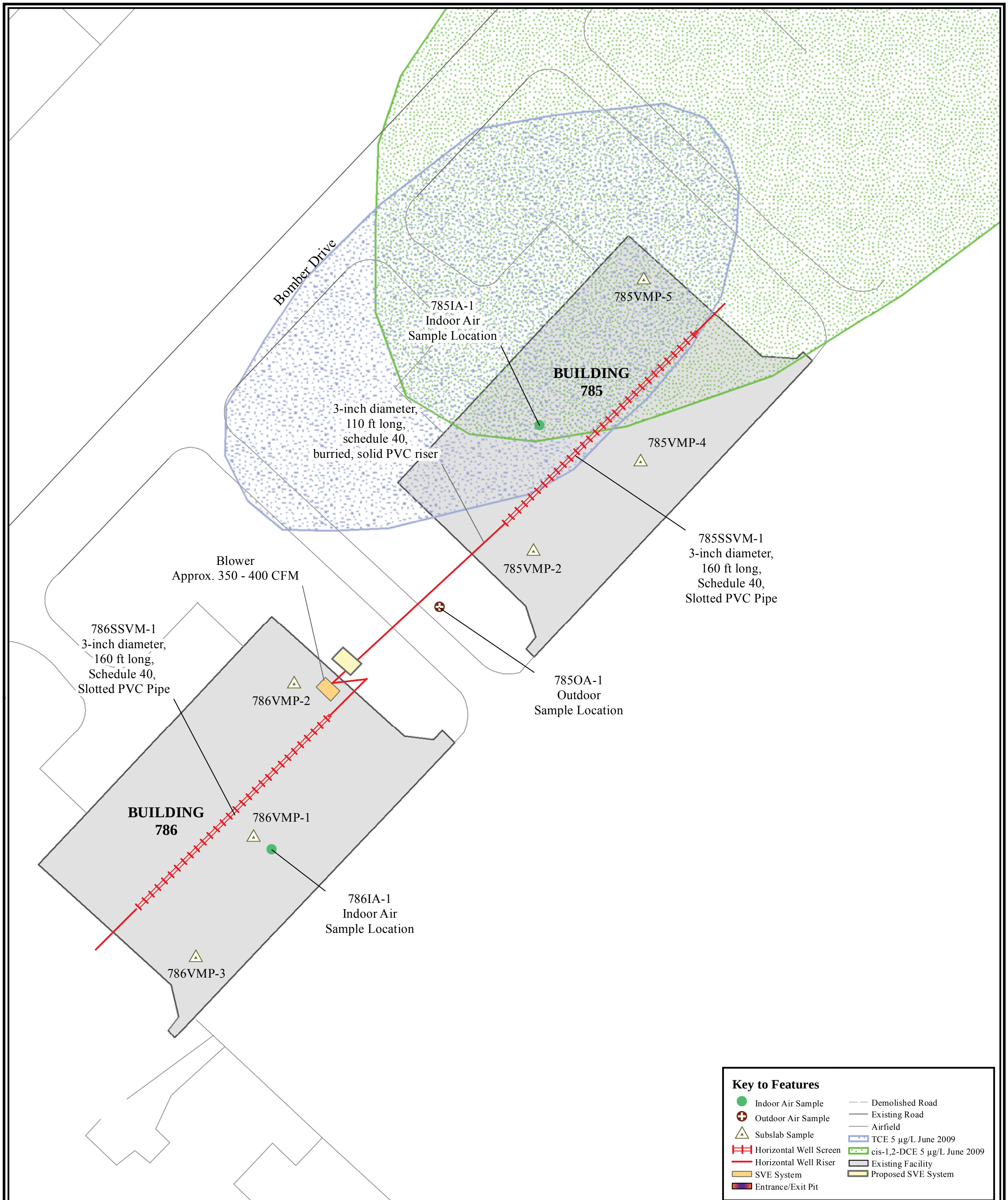
The ROI test was performed on 785SSVM-1 and 786SSVM-1 initially on March 24, 2011 and then again May 19, 2011. The initial ROI test determined that horizontal well 785SSVM-1 was underperforming because the influence of the vacuum did not cover the entire sub-slab. This horizontal well was redeveloped on March 29 and 30, 2011.

The initial ROI test on Building 785 shows a vacuum at 785VMP-5 below the sufficient vacuum of 0.1 in w.g. This VMP is the worst case scenario installed at the end of the well screen off axis by 60 ft. The second ROI test was conducted with a higher flow rate and lower vacuum. The test showed a sufficient vacuum at all VMPs in Building 785.

786VMP-1 and -3 show sufficient vacuum for both tests. 786VMP-2, located at the beginning of the well screen, 30 ft off axis, did not show sufficient vacuum (0.05 in w.g.). An additional point was installed next to 786VMP-2. The additional point did not show a sufficient vacuum measurement, therefore it has been determined that this portion of Building 786 sub-slab is not seeing sufficient vacuum influence due to structural constraints and/or preferential pathways.

8.2.3.3 Baseline and Start-up Vapor Monitoring Point Sub-Slab Sampling

A baseline sample was collected prior to system start-up at each newly installed VMP location. This baseline sample provides comparison data to the sampling events. The baseline sampling event in Building 785 was on March 18, 2011 and the baseline sampling event in Building 786 was on January 18, 2011 (part of the pilot study). In Building 785 there was a TCE exceedance in 785VMP-4 at 720 μg/m^3. 785VMP-5 was not sampled due to water observed in the point. In Building 786 there were TCE exceedances in 786VMP-1, -2 and -3 at 4,900 μg/m^3, 740 μg/m^3, and 2,200 μg/m^3, respectively. There was also a PCE exceedance in 786VMP-1 at 140 μg/m^3, and chloroform exccedances in 786VMP-2 and -3, at 620 μg/m^3 and 47 μg/m^3, respectively.



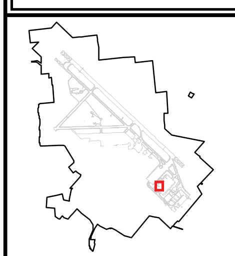


Figure 6
Buildings 785 and 786
SSVM System Layout

0 25 50 100 150
Feet

N

UNITED STATES AIR FORCE
GRIFFISS AIR FORCE BASE
ROME, NEW YORK

FPM Remediations, Inc

Y:\GIS_Projects\Griffiss\Projects\1015-11-01\SVI\SVI Proposed Plan\Figure 6.mxd

The 785SSVM-1 and 786SSVM-1 began consistent operation on May 19, 2011. After three months of the SSVM system operating, the system was shut off and the second sampling event occurred on August 24 and 25, 2011. The only TCE exceedance observed in both buildings was at 785VMP-5 (610 µg/m^3). All other points show a decreasing TCE trend and were below screening levels.

Indoor and outdoor air quality sampling was also conducted on August 24, 2011. Building 785 was below TCE screening levels at 1.1 µg/m^3, and Building 786 was below TCE screening levels at 2.5 µg/m^3. The outdoor air quality sampled collected between the two buildings TCE detection was at 0.82 µg/m^3.

The system was shut down again after 5 months of operation and a sampling event took place on October 24, 2011 where results showed all VMPs below TCE sub-slab screening levels. 785VMP-2, -4, and -5 TCE concentrations were 8.9 µg/m^3, 33 µg/m^3, and 140 µg/m^3, respectively. 786VMP-1, -2 and -3 TCE concentration ns were 49 µg/m^3, 140 µg/m^3, and 23 µg/m^3, respectively. The only exceedance for all VMPs was located in 786VMP-2 for chloroform at 72 µg/m^3.

Indoor and outdoor air quality sampling was also conducted on October 24, 2011. TCE was not detected at either Building 785 or Building 786. The outdoor air quality sampled collected between the two buildings had a TCE detection at 0.82 µg/m^3.

All sub-slab vapor, indoor air, and outdoor air sampling results are presented in Table 11.

8.2.3.4 Influent Vapor Sampling

An influent sample was collected during the initial startup of 785SSVM-1 and 786SSVM-2 extraction wells, on May 19, 2011, where the sample was grabbed before GAC treatment. The influent resulted in a TCE concentration of 3,500 µg/m^3. For the 3 month sampling event an influent sample was collected. The influent TCE concentration was 520 µg/m^3. After 5 months of system operation, sampling occurred on October 25, 2011 where the TCE influent concentration was 740 µg/m^3.

8.2.4 Ongoing Operations and Maintenance - Building 785 and 786

The Building 785 and 786 SSVM system has operated since May 2011. O&M includes weekly system component readings (system temperature, flow, vacuum and motor status), semi-annual VMP vacuum measurements, and GAC disposal and replacement every two months. Indoor and outdoor air sampling, sub-slab vapor sampling, and influent sampling are conducted semi-annually during the heating and cooling months (FPM Remediations Inc., February 2014). The two latest sampling events are described below.

Table 11
Building 785 and 786 SSVM Performance Monitoring
Sub-Slab Vapor, Indoor Air, and Outdoor Air Results

Building 785 VMPs

Sample Location	785VMP-2								785VMP-4					785VMP-5						
Sample Date	**3/18/11**	**10/6/10**	**10/18/10**	**12/2/10**	**8/24/11**	**10/24/11**	**1/31/12**	**8/8/12**	**3/18/11**	**8/24/11**	**10/24/11**	**1/31/12**	**8/8/12**	**8/25/11**	**10/24/11**	**3/22/11**	**10/6/10**	**3/22/11**	**1/31/12**	**8/8/12**
Sample Collection Duration (hr)	**0.08**	**0**	**0**	**0**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0**	**0**	**0**	**0.08**	**0.08**
Volatiles (TO-15) in µg/m³																				
1,2,4-trimethylbenzene	1.5	1.8	0.70 F	U	1.4	U	U	3.7	0.95	6.7	1.8	0.45 F	15	2.2	1.4	1.6	1	1.7	U	0.69 F
1,3,5-trimethylbenzene	U	U	U		U	U	U	1.0	U	2.1	0.50 F	U	3.9	0.85	U	0.60 F	U	U	U	U
benzene	2.9	2.2	0.49	U	0.65	2.2	U	U	4.9	4.2	8.4	0.64	0.57 F	0.39 F	2.6	1.1	U	U	0.64	0.50 F
cis-1,2-dichloroethene	U	9.5	1.1	0.6	U	U	U	U	2.3	U	U	U	U	2.1	U	1.1	U	U	U	U
ethylbenzene	1.5	0.44 F	U	U	U	0.75	U	1.2	1.1	6.1	4.9	0.58 F	3.9	2.3	1.6	6	U	0.53 F	1.8	3.8
m,p-xylene (sum of isomers)	4.7	0.97 F	0.84 F	U	0.93 F	2.3	0.21 F	4.5	2.7	14	14	1.1 F	3.4	8.2	5.8	11 F	U	2.3	3.6	14
naphthalene	U	U	U	U	U	U	U	2.2 F	U	U	U	U	0.68 F	U	U		NA		U	0.46 F
o-xylene	1.3	0.49 F	U	U	U	0.71	U	1.6	0.84	5.1	2.8	0.46 F	1.7	3	1.5	5	U	0.79	1.7	4.7
tetrachloroethylene (pce)	U	3.5	U	U	U	U	U	0.73 F	U	U	1.0	U	1.2 F	2.2	U	9	U	U	U	U
toluene	15	1.4	1.2	U	3.3	6.2	0.36 FB	3.8	26	23	42	2.2 B	5.9	2.1	7.4	1.7	0.84	2.2	1.6 B	3.7
trichloroethylene (tce)	U	3600	940	170	19	8.9	1.0 F	9.1	720	88	33	3.5	39	610	140	2200	7.3	1.1	18	20
vinyl chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

Building 786 VMPs

Sample Location	786VMP-1					786VMP-2					786VMP-3				
Sample Date	**1/18/11**	**8/24/11**	**10/24/11**	**1/27/12**	**8/8/12**	**1/18/11**	**8/24/11**	**10/24/11**	**2/7/12**	**8/8/12**	**1/18/11**	**8/24/11**	**10/24/11**	**1/27/12**	**8/8/12**
Sample Collection Duration (hr)	**0**	**0.08**	**0.08**	**0.08**	**0.08**	**0**	**0.08**	**0.08**	**0.08**	**0.08**	**0**	**0.08**	**0.08**	**0.08**	**0.08**
Volatiles (TO-15) in µg/m³															
1,2,4-trimethylbenzene	7.5	6.9	1.2	U	0.38 F	4.5	7.5	1.6	0.62 F	1.2	13	2.4	0.8	0.33 F	U
1,3,5-trimethylbenzene	5.2	1.9	U	U	U	1.7	3.1	0.55 F	0.26 F	0.33 F	9.9	0.65 F	U	U	U
benzene	19	3.1	9.1	U	U	4.6	0.32 F	2.2	U	0.19 F	4.7	0.32 F	4.2	0.25 F	1.0
cis-1,2-dichloroethene	9.7	U	U	U	U	1.4	U	U	U	U	1.1	U	U	U	U
ethylbenzene	6.6	4.6	3.1	U	0.34 F	1.5	8.8	2.7	1.4	1.9	9.8	1.6	1.1	0.40 F	0.34 F
m,p-xylene (sum of isomers)	17	19	11	0.32 F	1.0 F	4.8	32	9.9	4.6	7.2	16	5.3	3.4	1.4 F	0.75 F
naphthalene	U	U	U	U	U	U	U	U	U	0.53 F	U	U	U	U	0.87 F
o-xylene	7.5	4.9	2.0	0.11 F	0.39 F	2.2	6.6	2.1	1.1	1.6	6.2 F	1.5	0.84	0.38 F	0.24 F
tetrachloroethylene (pce)	140	3.7	2.0	2.4	1.5	11	0.83 F	2.9	U	0.82 F	85	2.6	1.5	U	4.6
toluene	35	15	29	0.61 F	1.5	6.7	16	11	2.2 B	4.4	16	5.2	7.7	0.62 F	2.7
trichloroethylene (tce)	4,900	84	49	13	24	740	260	140	22	110	2,200	51	23	1.9	36
vinyl chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

Building 785 and 786 Indoor and Outdoor

Sample Location	785-IA				785/786-OA				786-IA			
Sample Date	**8/24/11**	**10/24/11**	**1/27/12**	**8/8/12**	**8/24/11**	**10/24/11**	**1/27/12**	**8/8/12**	**8/24/11**	**10/24/11**	**1/27/12**	**8/8/12**
Sample Collection Duration (hr)	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**
Volatiles (TO-15) in µg/m³												
1,2,4-trimethylbenzene	1.7	1.4	U	0.37 F	1.3	2.6	U	0.73 F	5.1	1.9	U	0.59 F
1,3,5-trimethylbenzene	U	U	U	U	U	U	U	U	2.6	U	U	U
benzene	U	1.3	0.58 F	0.36 F	0.39 F	1.8	0.56 F	0.80 F	0.91	1.3	0.75	0.47 F
cis-1,2-dichloroethene	U	U	U	U	U	U	U	U	0.64	U	U	U
ethylbenzene	U	0.75	0.13 F	0.22 F	U	1.3	U	1.4 F	3	1.8	0.67 F	1.3
m,p-xylene (sum of isomers)	1.0 F	2.4	0.29 F	0.65 F	0.75 F	4.3	0.30 F	3.8 F	11	6.2	1.8 F	3.9
naphthalene	U	U	U	U	U	U	U	1.1 F	U	U	U	U
o-xylene	U	0.75	0.11 F	0.22 F	U	1.3	U	1.3 F	2.7	1.7	0.51 F	1.0
tetrachloroethylene (pce)	U	21	U	U	U	U	U	1.7 F	U	U	U	0.34 F
toluene	4.2	4.0	1.4 B	1.3	2.3	7.2	0.57 FB	17	8.8	9.4	2.4 B	7.3
trichloroethylene (tce)	1.1	U	U	U	0.82	0.82	U	U	2.5	U	U	U
vinyl chloride	U	U	U	U	U	U	U	U	U	U	U	U

Notes:
U - Not detected.
F- Analyte detectd at or below quantitation limits.
NA- Not Available
µg/m³: microgram per cubic meter.
Exceedance of the screening level.
B - Analytes detected in the trip blank.

Sub-slab vapor, indoor and outdoor air sampling occurred at Buildings 785 and 786 on March 6, 2013. The highest sub-slab vapor TCE concentrations that were detected are provided below. TCE was not detected in the indoor and outdoor air samples.

- Building 785 - TCE concentration: 3 µg/m^3 at location 785VMP-4, and
- Building 786 - TCE concentration: 9.1 F µg/m^3 at location 786VMP-1.

Semi-annual influent sampling occurred on February 14, 2013, prior to sub-slab vapor sampling to determine effective SVE. Influent results at Buildings 785 and 786 for TCE were 93 µg/$m^{\mathbf{3}}$. Sub-slab vapor, indoor and outdoor air sampling occurred at Buildings 785 and 786 on August 9, 2013. The highest sub-slab vapor TCE concentrations that were detected are provided below. TCE was not detected in the indoor and outdoor air samples.

- Building 785 - TCE concentration: 17 µg/m^3 at location 785VMP-4, and
- Building 786 - TCE concentration: 150 µg/m^3 at location 786VMP-2.

Semi-annual influent sampling occurred on August 7, 2013, prior to sub-slab vapor sampling to determine effective SVE. Influent results at Buildings 785 and 786 for TCE were 130 µg/$m^{\mathbf{3}}$.

All sub-slab vapor, indoor air, and outdoor air sampling results are presented in Table 11 and influent air sampling results are presented in Table 12. Figure 7 shows the trend for sub-slab results at Buildings 785 and 786 since the start-up of the SSVM system. All of the O&M sub-slab sampling results were below vapor screening levels. All indoor and outdoor air concentrations were within an acceptable range and did not pose any unacceptable risk to building occupants.

8.3 Operating Properly and Successfully

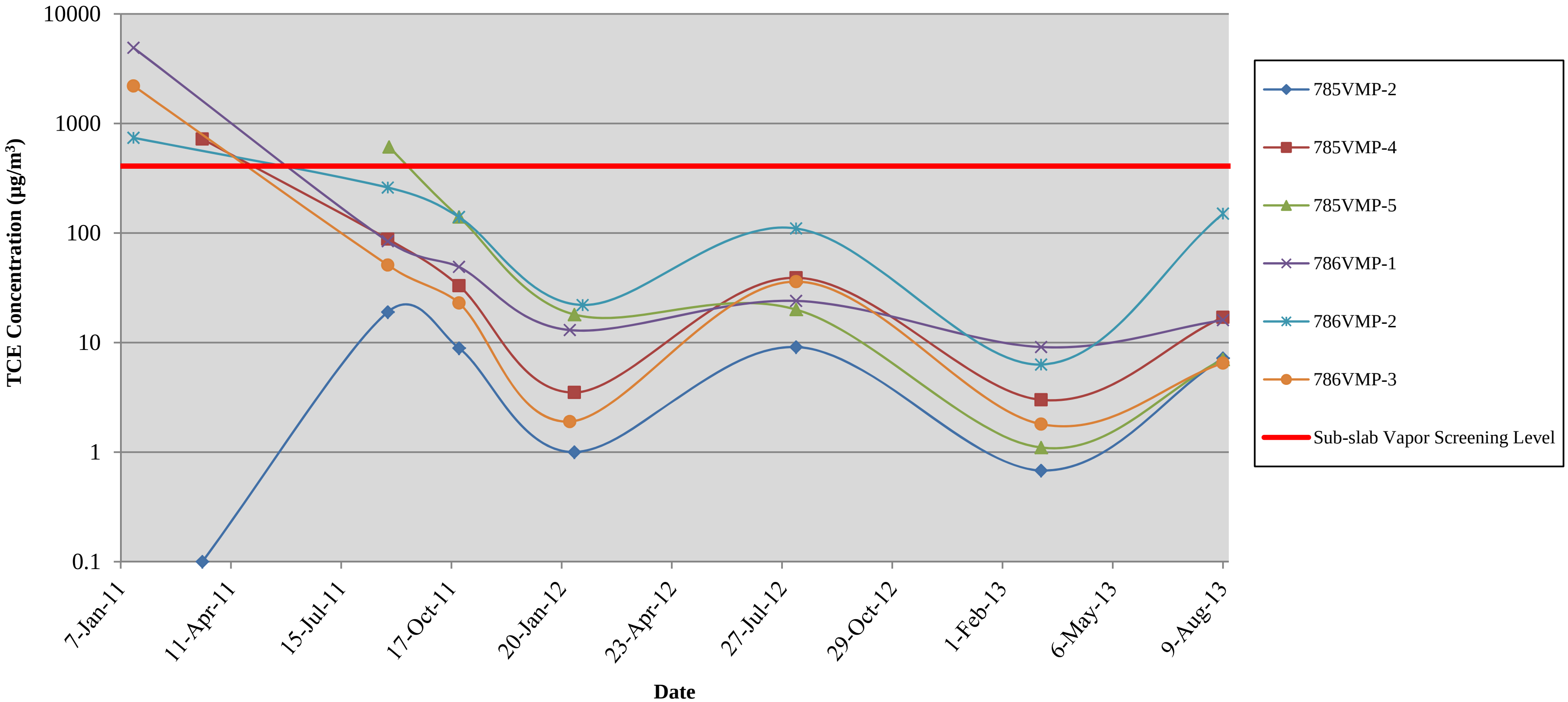
Based on system O&M and performance monitoring data collected and evaluated from January 2011 through September 2013, the systems are operating properly and successfully. The latest performance monitoring results when compared to the baseline sampling results of both SSVM systems indicated a decreasing trend in TCE in all sub-slab VMPS, indoor and outdoor air concentrations, and influent air sampling results. In addition, the latest vacuum readings showed that all VMPs were under vacuum except for two VMPs associated with the Building 774 and 776 system and one VMP associated with the Building 785 and 786 system. The lack of vacuum is attributed to the structural foundation and/ or preferential paths. However, vapor mitigation is still occurring at these locations, supported by decreasing concentrations observed during semi-annual sampling events.

Table 12
Buildings 785 and 786
SSVM Performance Monitoring Influent Air Results

Sample Location	**785786-Influent**				
Sample Date	**19-May-2011**	**23-Aug-2011**	**25-Oct-2011**	**24-Jan-2012**	**3-Aug-2012**
Volatiles (TO-15) in µg/m^3					
1,2,4-trimethylbenzene	6.9	1.7	2.8	0.26 F	1.4 F
1,3,5-trimethylbenzene	6.3	1.5	U	U	0.65 F
benzene	1.9	0.81	U	U	0.51 F
cis-1,2-dichloroethene	17	4.5	3.0	0.56 F	1.6
ethylbenzene	5.9	2.9	1.7	0.30 F	1.1 F
m,p-xylene (sum of isomers)	16	6.3	6.0	0.98 F	3.3
naphthalene	U	U	U	U	2.3 F
o-xylene	6.5	3.4	1.9	0.30 F	1.3 F
tetrachloroethylene (pce)	250	52	72	11	22
toluene	5.6	3.4	3.8	0.44 F	9.5
trichloroethylene (tce)	3,500	520	740	140	250
vinyl chloride	U	U	U	U	U

Notes:
U - Not detected.
F- Analyte detectd at or below quantitation limits
NA- Not Available
µg/m^3: microgram per cubic meter.
Exceedance of the indoor or outdoor initial benchmark.
B - Analytes detected in the trip blank.

Figure 7
Sub-Slab TCE Trend Chart Buildings 785 and 786
(March 2011 through September 2013)



Note: Not detected results are plotted as 0.1 µg/m³.

9 DESCRIPTION OF THE PREFERRED ALTERNATIVE

Under the selected remedial approach for SD-052-02 Building 775 Site [Buildings 774 and 776] and SD-052-01 Apron 2 Chlorinated Plume Site [Buildings 785 and 786] (SVI mitigation by sub-slab depressurization), sub-slab depressurization through horizontal wells will continue operation at Buildings 774, 776, 785, and 786. The interior of the buildings are untouched under this alternative, and there will be no installation of vapor barriers. The sub-slab is actively depressurized by imposing negative pressure under the slabs by mechanical (regenerative) blowers, and the extracted vapors are discharged to a vapor treatment system consisting of activated carbon vessels. The latest sampling results from the Interim Remedial Action when compared to the baseline sampling results at SD-052-02 Building 775 Site [Buildings 774 and 776] and SD-052-01 Apron 2 Chlorinated Plume Site [Buildings 785 and 786] SSVM systems indicate a decreasing trend in TCE in sub-slab VMPS. All sub-slab vapor concentrations were below screening levels. All indoor and outdoor air concentrations were also below screening levels and did not pose any unacceptable risk to building occupants. Influent sampling results at both sites indicated a decreasing trend in TCE.

During SVI mitigation, the SSVM systems will continue to be checked on a weekly basis (vacuum gage readings, flow meter readings, etc) to ensure proper operation. Semi-annual sub-slab vapor, indoor air, and outdoor air sampling is included in this alternative to verify the effectiveness of the alternative and to show that the alternative meets its objective. Results will be reported after each sampling event and the performance monitoring program will be reviewed for effectiveness and redundancy. In addition, Land-Use Controls/Institution Controls (LUC/ICs) will be implemented at both buildings which will include deed restrictions that prohibit compromising the slabs without prior Air Force approval and Air Force consultation with EPA and NYSDEC. Since buildings 774 and 776 have been transferred, a modification to that deed will be necessary.

10 COMMUNITY PARTICIPATION

The agencies desire to have an open dialogue with citizens concerning the results of the removal actions and subsequent investigations at this AOC and encourage citizens to participate by commenting on the proposal for SVI mitigation by sub-slab depressurization at the sites. This interaction between the agencies and the public is critical to the CERCLA process and to making sound environmental decisions. Details on these sites, the environmental program, and all reports referred to in this document are available for review in the Air Force Civil Engineer Center (AFCEC) administrative record website at http://afcec.publicadmin-Record.us.af.mil.

The public is encouraged to review all aspects of previous investigations for these sites and administrative record and comment on the agencies' proposal for SVI mitigation by sub-slab depressurization at the sites.

The agencies will consider all public comments on this proposed plan in preparing the ROD. Depending on comments received, the plan presented in the ROD could be different from the preferred alternatives presented in this proposed plan. All written and verbal comments will be summarized and responded to in the responsiveness summary section of the ROD, which is scheduled to be issued by **DATE**, 2014.

To Participate:

Whether you are readings this type of document for the first time or are familiar with the Superfund process, you are invited to participate in the process.

- Read this proposed plan and review additional documents in the administrative record file.
- Contact the Air Force, EPA, or NYSDEC project managers listed on page ### to ask questions or request information.
- Attend a public meeting and give verbal comments.
- Submit written comments by DATE, 2014.

10.1 Public Comment Period

The agencies have set a public comment period from DATE, 2014 to DATE, 2014 to encourage public participation in the selection process. Written comments should be sent to:

Mr. Michael McDermott
BRAC Environmental Coordinator
Air Force Civil Engineer Center
706 Brooks Road
Rome, New York 13441

10.2 Public Meeting

The comment period includes a public meeting at which the Air Force will present the proposed plan. Representatives from the agencies will be available to answer questions and accept both oral and written comments. The public meeting is scheduled for TIME pm, DATE, 2014, and will be held at Griffiss Institute, 725 Daedalian Drive, Griffiss Business & Technology Park, Rome, New York.

10.3 Additional Griffiss Air Force Base Environmental Information

General information concerning the environmental program at the former Griffiss AFB can be found on the AFCEC administrative record website **at** http://afcec.publicadmin-Record.us.af.mil**.** Visit the website or call 315-356-0810 to ask about the installation activities or request background information.

10.4 Agencies

Three agencies have been identified in the Federal Facilities Agreement: the Air Force, NYSDEC, and EPA. The agreement ensures that environmental impacts on public health, welfare, and the environment associated with past and present activities at the former Griffiss AFB are thoroughly investigated and appropriate remedial actions are taken as necessary to protect public health, welfare, and the environment. Any of the following agency representatives may be contacted to obtain additional information:

Air Force:
Mr. Michael McDermott
BRAC Environmental Coordinator
Air Force Civil Engineer Center
706 Brooks Road
Rome, New York 13441
315-356-0810

NYSDEC:
Ms. Heather Bishop
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12 GLOSSARY

Administrative Record: A file established and maintained in compliance with section 113(K) of the Comprehensive Environmental Response, Compensation, and Liability Act consisting of information upon which the lead agency bases its final decisions on the selection of remedial method(s) for a Superfund site. The Administrative Record is available to the public.

Agency for Toxic Substances and Disease Registry (ATSDR): The federal agency responsible for performing health assessments for facilities on the National Priorities List.

Base Realignment and Closure Act (BRAC): A federal law that established a commission to determine which military bases would be closed and which would remain active.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act (SARA). The act requires federal agencies to investigate and remediate abandoned or uncontrolled hazardous waste sites.

Federal Facility Agreement: An agreement between the EPA, the State of New York, and the Air Force to evaluate waste disposal sites at the former Griffiss AFB and perform remediation if necessary.

Feasibility Study (FS): An evaluation to identify and evaluate appropriate remedial goals and remedial alternatives for a site based upon United States Environmental Protection Agency criteria.

Groundwater Recharge Zone: An area where the underlying aquifer (water bearing zone) receives water (recharge) through downward flow from both precipitation which infiltrates into the ground and other surface water bodies such as streams, lakes, etc.

Installation Restoration Program (IRP): The United States Air Force subcomponent of the Defense Environment Restoration Program (DERP) that specifically deals with investigating and remediating sites associated with suspected releases of toxic and hazardous materials from past activities. The DERP was established to clean up hazardous waste disposal and spill sites at Department of Defense facilities nationwide.

Institutional Controls: Non-engineering measures designed to prevent or limit exposure to hazardous substances left in place at a site, or to verify the effectiveness of the chosen remedy. Institutional controls are usually, but not always, legal controls, such as easements, restrictive covenants, and zoning ordinances.

Monitoring: Ongoing collection of information about the environment that helps gauge the effectiveness of a cleanup action. Information gathering may include groundwater well sampling, surface water sampling, soil sampling, air sampling, and physical inspections.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): The NCP provides the organization, structure and procedures for preparing for and responding to discharges of oil and releases of hazardous substances, pollutants, and contaminants. The NCP is required under CERCLA and the Clean Water Act, and EPA has been delegated the responsibility for preparing and implementing the NCP. The NCP is applicable to response actions taken pursuant to the authorities under CERCLA and the Clean Water Act.

National Priorities List: EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under the Superfund program.

Operation and Maintenance (O&M): A step in the remedial program. While a site is being remediated, it is overseen to make sure that the remedy is working as planned and that the construction remains operational.

Proposed Plan: A public document that solicits public input on a recommended remedial alternative to be used at a National Priorities List (NPL) site. The Proposed Plan is based on information and technical analysis generated during the RI/FS. The recommended remedial action could be modified or changed based on public comments and community concerns.

Record of Decision (ROD): A public document that explains the remedial alternative to be used at a National Priorities List (NPL) site. The ROD is based on information and technical analysis generated during the RI and on consideration of the public comments and community concerns received on the Proposed Plan. The ROD includes a Responsiveness Summary of public comments.

Remedial Action: An action that stops or substantially reduces a release or threat of a release of hazardous substances that is serious but not an immediate threat to human health or the environment.

Superfund: The trust fund, created by CERCLA out of special taxes, used to investigate and clean up abandoned or uncontrolled hazardous waste sites. Out of this fund EPA either: (1) pays for site remediation when parties responsible for the contamination cannot be located or are unwilling or unable to perform the work or (2) takes legal action to force parties responsible for site contamination to clean up the site or pay back the federal government for the cost of the remediation. Federal facilities are not eligible for Superfund monies.

Volatile Organic Compounds (VOCs): Organic constituents which tend to volatilize or to change from a liquid to a gas form when exposed to the atmosphere. Many VOCs are readily transported in groundwater.

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