FINAL
WORK PLAN

August 2010 Vapor Intrusion Data Collection Activities at Air Force Plant 59

Johnson City, New York

Prepared for:

Air Force Center for Engineering and the Environment
Lackland Air Force Base, Texas

and

Aeronautical Systems Center
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Contract No. FA8903-08-D-8770
Task Order No. 0152

August 2010

PREFACE

This *Work Plan (WP)* was written by AECOM to describe the field activities associated with the August 2010 vapor intrusion data collection activities at the Air Force Plant 59 (AFP 59). The work is to be completed under the Air Force Center for Engineering and the Environment (AFCEE) Contract No. FA8903-08-D-8770, Task Order No. 0152.

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REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	2. REPORT TYPE	3. DATES COVERED *(From - To)*
10-08-2010	Final	August 2010

4. TITLE AND SUBTITLE

Final Work Plan
August 2010 Vapor Intrusion Data Collection Activities at Air Force Plant 59

5a. CONTRACT NUMBER
FA8903-08-D-8770; T.O. 0152

5b. GRANT NUMBER
N/A

5c. PROGRAM ELEMENT NUMBER
N/A

6. AUTHOR(S)

AECOM

5d. PROJECT NUMBER
N/A

5e. TASK NUMBER
N/A

5f. WORK UNIT NUMBER
N/A

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) AND ADDRESS(ES)

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8. PERFORMING ORGANIZATION REPORT NUMBER
N/A

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

Air Force Center for Engineering and the Environment
Lackland Air Force Base, TX

10. SPONSOR/MONITOR'S ACRONYM(S)
AFCEE

11. SPONSOR/MONITOR'S REPORT NUMBER(S)
N/A

12. DISTRIBUTION / AVAILABILITY STATEMENT

Approved for Public Release; Distribution is Unlimited.

13. SUPPLEMENTARY NOTES
N/A

14. ABSTRACT

This *Final Work Plan* describes the field activities associated with the August 2010 vapor intrusion data collection activities at AFP 59. The objective of this study is to collect co-located indoor air and sub-slab vapor samples at the AFP 59 Manufacturing Building to determine if the elevated TCE indoor air concentrations detected in August 2009 were the result of vapor intrusion or some other factor.

15. SUBJECT TERMS
Vapor Intrusion, Air Force Plant 59

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Andrew Foley
Unclassified	Unclassified	Unclassified	SAR	14	19b. TELEPHONE NUMBER *(include area code)* (703) 549-8728

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

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LIST OF ACRONYMS AND ABBREVIATIONS

AFCEE	Air Force Center for Engineering and the Environment
AFP 59	Air Force Plant 59
ASC	Aeronautical Systems Center
DQO	Data Quality Objective
µg/m^3	Micrograms per Cubic Meter
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PID	Photoionization Detector
QA/QC	Quality Assurance/Quality Control
USEPA	United States Environmental Protection Agency
VI	Vapor Intrusion
VOC	Volatile Organic Compounds
WP	Work Plan

1.0 INTRODUCTION

This *Final Work Plan (WP)*, written as a supplement to the *Final Work Plan for the Vapor Intrusion Investigation, Monitoring Well Abandonment, Groundwater Monitoring, and Fire Suppression Reservoir Investigation, AFP 59, Johnson City, New York* (AECOM, 2009a), describes the procedures and techniques that will be used to conduct the August 2010 vapor intrusion (VI) data collection activities at Air Force Plant 59 (AFP 59) in Johnson City, New York. This supplemental *WP* further expands on the previous project scope and objectives based on the initial findings from the completed activities; the previous project was completed under Contract FA8903-08-D-8770, Task Order 0058. AECOM has prepared this *WP* under contract to the Air Force Center for Engineering and the Environment (AFCEE) as part of the requirements for Contract FA8903-08-D-8770, Task Order 0152. This supplemental *WP* contains proposed project scope and objectives, reporting requirements, and project schedule.

1.1 PROPOSED PROJECT ACTIVITIES

The following activities will be completed during the execution of this task order:

1. Preparation of the *WP* and other supporting documents.
2. Collection of indoor air and sub-slab vapor samples from inside the Manufacturing Building at AFP 59. Samples will be analyzed for volatile organic compounds (VOCs).
3. Collection of outside air samples at AFP 59. Samples will be analyzed for VOCs.
4. Preparation of a report presenting the data generated as part of the field investigation.

1.2 SUMMARY OF PREVIOUS INVESTIGATIONS

Based on the data generated during the previous VI investigation (Contract FA8903-08-D-8770, Task Order 0058), elevated trichloroethene (TCE) concentrations were detected at a high frequency in indoor air samples collected during the August 2009 sampling event; 50 of the 118 TCE detections exceeded the industrial background concentration for indoor air of 4.2 micrograms per cubic meter ($\mu g/m^3$). This high frequency of TCE indoor air detections was not encountered during the two subsequent sampling events (November 2009 and February 2010). While indoor air sampling was not the sole focus of the previous investigation, the noted TCE indoor air concentrations led to the current VI investigation described in this *WP*.

For a summary of other previous investigations at AFP 59, refer to the *Final Work Plan for the Vapor Intrusion Investigation, Monitoring Well Abandonment, Groundwater Monitoring, and Fire Suppression Reservoir Investigation, AFP 59, Johnson City, New York* (AECOM, 2009a).

2.0 PROJECT SCOPE AND OBJECTIVES

2.1 OBJECTIVE

The objective of this study is to collect co-located indoor air and sub-slab vapor samples at the AFP 59 Manufacturing Building to determine if the elevated TCE indoor air concentrations detected in August 2009 were the result of VI or some other factor. To accomplish this objective, co-located indoor air and sub-slab vapor samples will be collected at up to 60 locations in the Manufacturing Building.

2.1.1 Data Quality Objectives

Data quality objectives (DQOs) are quantitative and qualitative goals that specify the quantity and quality of the data required to support decisions during remedial response activities. Guidelines followed in the preparation of DQOs for the vapor intrusion data collection activities at AFP 59 are detailed in the *Guidance for the DQO Process, United States Environmental Protection Agency (USEPA) QA/G-4* (USEPA, 1994a) and the New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation *Draft Technical Guidance for Site Investigation and Remediation* (NYSDEC, 2002).

DQOs are determined based on the end use(s) of the data. For the AFP 59 indoor air, sub-slab vapor, and outdoor air samples, the primary objective is to determine if subsurface vapors are impacting indoor air quality.

The DQO process for the VI data collection activities are presented below. The discussion provides a step-by-step description of the development of DQOs and rationale for the VI data collection activities.

1. **Problem.** In August 2009, elevated TCE concentrations were detected at a high frequency in indoor air samples, with 50 samples exceeding the industrial background concentration for indoor air of 4.2 $\mu g/m^3$.
2. **Boundaries of Study.** The boundaries of the study area were determined based on analytical data from the previous VI investigation and property boundaries. The study area for these VI data collection activities includes the Manufacturing Building at AFP 59. All 60 locations to be sampled during this VI investigation were installed and monitored during the previous VI investigation.
3. **Sampling Approach.** The data will be collected to further quantitatively and qualitatively evaluate the nature and extent of contamination, and to provide health and safety monitoring. Field equipment, such as a photoionization detector (PID), will be used to collect the screening-level data.

   Co-located indoor air and sub-slab vapor samples will be collected at 60 existing locations, and outdoor air samples will be collected at 3 locations. The data will be used to determine if the elevated TCE indoor air concentrations detected in August 2009 were the result of VI or some other factor. All samples will be analyzed for VOCs by USEPA Method TO-15.

2.2 SAMPLE ANALYSIS SUMMARY

The proposed additional laboratory analyses for the indoor air, sub-slab vapor, and outdoor air samples are based on the types of chemicals used at AFP 59 and the chemicals previously detected in samples collected in the study area. A summary of the proposed laboratory analyses, including the number of environmental samples and quality assurance/quality control (QA/QC) samples, is provided in Table 2-1. QA/QC sampling requirements will be performed as described in the project-specific *Final Quality Assurance Project Plan for the Vapor Intrusion Investigation, Groundwater Monitoring Activities and Well Abandonment at AFP 59, Johnson City, New York* (AECOM, 2009b).

Table 2-1
Sample Analysis Summary

Method	Matrix	# Samples	# Equipment Blanks	# Ambient Blanks	# Trip Blanks	# Field Duplicates	# MS/MSD Samples	Total # Samples
On-site Vapor Intrusion Investigation								
TO-15	Indoor Air	60	0	0	0	6	3	66
TO-15	Sub-slab Vapor	60	0	0	0	6	3	66
TO-15	Outside Air	6	0	0	0	1	0	7

Key: MS/MSD = Matrix Spike/Matrix Spike Duplicate

Note: MS/MSD samples are taken from the same Summa® canister as the normal sample; therefore, the total number of samples does include the MS/MSD samples.

3.0 PROJECT TASKS

This section describes the required tasks to be completed during this event, including field and laboratory activities.

3.1 FIELD INVESTIGATION TASKS

The objective of the VI data collection activities will be achieved through the field investigation, which will include the following activities: (1) mobilization to and from the site by AECOM personnel and subcontractors; (2) collection of co-located indoor air and sub-slab vapor samples from 60 locations within the Manufacturing Building; and (3) collection of outdoor air samples at 3 locations. A brief description of each field activity is provided in the following sections.

3.1.1 Mobilization

Fieldwork for the VI data collection activities will be conducted in one field mobilization. Activities associated with the initiation of the field investigation (e.g., securing identification badges and vehicle passes, and identifying and staging areas for equipment) will be coordinated with the facility point-of-contact.

3.1.2 Vapor Intrusion Sampling

The objective of the field investigation is to further evaluate the VI potential inside the AFP 59 Manufacturing Building.

Co-located Indoor Air and Sub-Slab Vapor Sampling

One round of co-located indoor air and sub-slab vapor samples will be collected at 60 of the existing monitoring points (see Figure 3-1). All sampling activities, including conducting a product inventory at each location and completing the *Indoor Air Quality Questionnaire and Building Inventory* form (New York State Department of Health [NYSDOH], 2006), will be conducted in accordance with the methodologies outlined in the *Final Work Plan for the Vapor Intrusion Investigation, Monitoring Well Abandonment, Groundwater Monitoring, and Fire Suppression Reservoir Investigation, AFP 59, Johnson City, New York* (AECOM, 2009a).

Outdoor Air Sampling

Outside air samples will be collected to determine if background concentrations may be contributing to indoor air concentrations. Summa® canisters will be set to collect outdoor air samples to mimic the sample schedule of the indoor air and sub-slab vapor samples. All sampling activities will be conducted in accordance with the methodologies outlined in the *Final Work Plan for the Vapor Intrusion Investigation, Monitoring Well Abandonment, Groundwater Monitoring, and Fire Suppression Reservoir Investigation, AFP 59, Johnson City, New York* (AECOM, 2009a).

3.2 SITE PERSONNEL

Table 3-1 lists anticipated project personnel.

Figure 3-1: Proposed Indoor Air / Sub-Slab Vapor Sample Locations

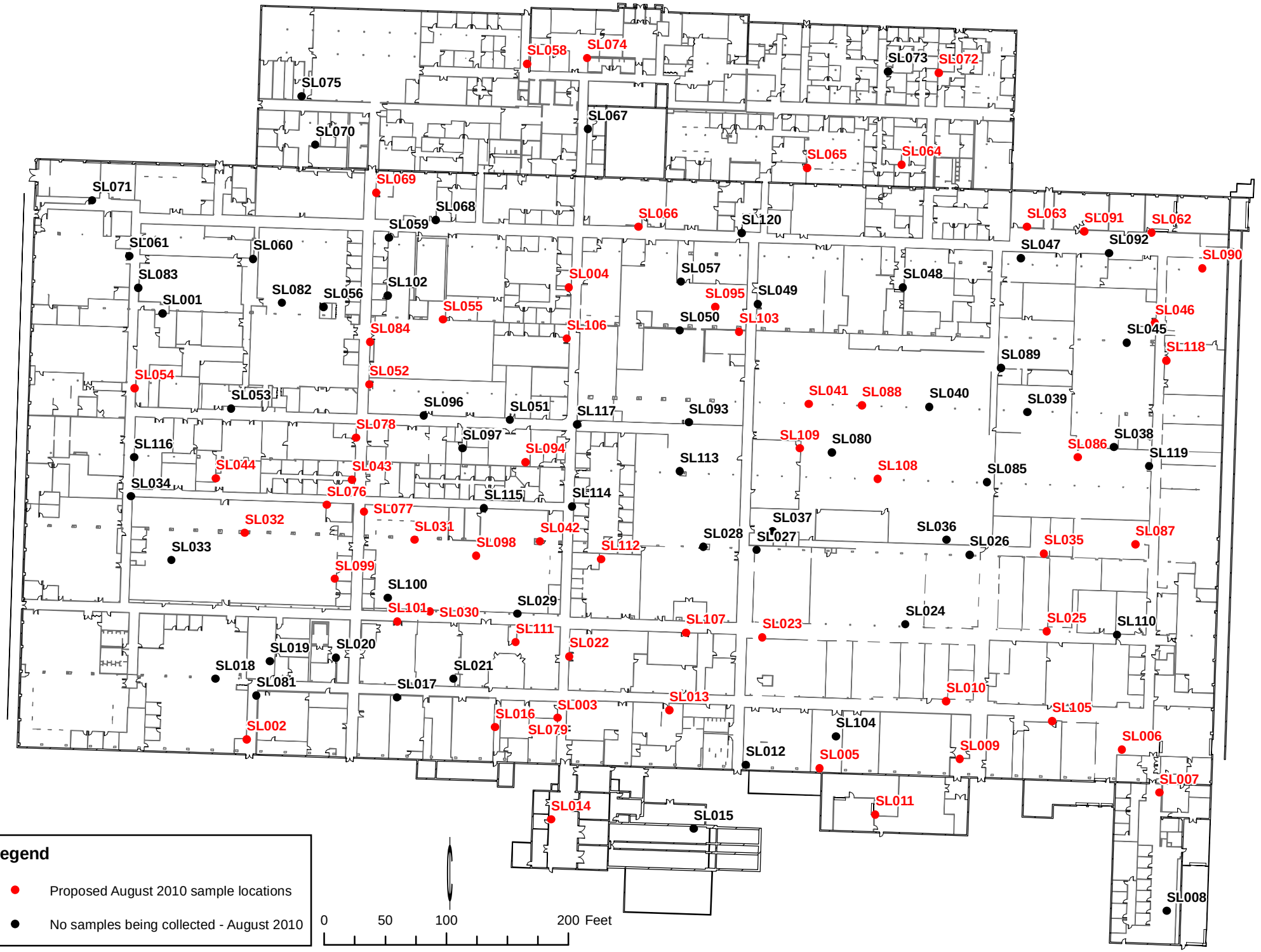

Table 3-1
Personnel Responsibilities

Title	Name
BAE Systems Coordinator	Stacey Whallon/Tom Tokos
ASC Project Manager	George Walters
AFCEE Project Manager	Kristi Doll
AECOM Project Manager	Dave Parse
AECOM Site Manager	Drew Foley
Analytical Laboratory-Soil Gas	Centek Laboratories, LLC
Health and Safety Professional	Sean Liddy
Site Health and Safety Professional	Drew Foley

3.3 SUBCONTRACTORS

Subcontractors will be needed to complete the VI investigation, including:

- Off-Site Laboratory Analysis: Centek Laboratories
- Investigation-Derived Waste Disposal: Clean Harbors.

4.0 DATA ASSESSMENT, RECORDS, AND REPORTING REQUIREMENTS

Data assessment, records, and reporting requirements are described in the *Final Work Plan for the Vapor Intrusion Investigation, Monitoring Well Abandonment, Groundwater Monitoring, and Fire Suppression Reservoir Investigation, AFP 59, Johnson City, New York* (AECOM, 2009a).

5.0 REFERENCES

AECOM. 2009a. *Final Work Plan for the Vapor Intrusion Investigation, Monitoring Well Abandonment, Groundwater Monitoring, and Fire Suppression Reservoir Investigation, AFP 59, Johnson City, New York.* August.

———. 2009b. *Final Quality Assurance Project Plan for the Vapor Intrusion Investigation, Groundwater Monitoring Activities and Well Abandonment at AFP 59, Johnson City, New York.* August.

New York State Department of Environmental Conservation (NYSDEC). 2002. *Draft Technical Guidance for Site Investigation and Remediation.*

New York State Department of Health (NYSDOH). 2006. *Guidance for Evaluating Soil Vapor Intrusion in the State of New York.*

United States Environmental Protection Agency (USEPA). 1994a. *Guidance for the Data Quality Objectives Process EPA QA/G-4.* Quality Assurance Management Staff, EPA/600/R-96/055. September.