



January 17, 2013

Mr. Todd Davis
Site Assessment Manager
U.S. Environmental Protection Agency, Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

**Subject: Quality Assurance Project Plan for a Removal Action
Municipal Farms – Animal Shelter Site, Kansas City, Missouri
U.S. EPA Region 7 START 3, Contract No. EP-S7-06-01; Task Order No. 0002.015.022
Task Monitor: Todd Davis, Site Assessment Team Leader**

Dear Mr. Davis:

Tetra Tech, Inc. is submitting the attached Quality Assurance Project Plan for a Limited Phase II Targeted Brownfields Assessment (TBA) at the Municipal Farms – Animal Shelter site in Kansas City, Missouri. If you have any questions or comments, please contact the project manager at (816) 412-1742.

Sincerely,

A handwritten signature in blue ink that reads 'Kaitlyn Bahr'.

Kaitlyn Bahr
START Project Manager

A handwritten signature in black ink that reads 'Ted Faile'.

Ted Faile, PG, CHMM
START Program Manager

Enclosures

cc: Roy Crossland, START Project Officer (cover letter only)

**QUALITY ASSURANCE PROJECT PLAN
FOR A LIMITED PHASE II TARGETED BROWNFIELDS ASSESSMENT AT THE
MUNICIPAL FARMS – ANIMAL SHELTER SITE
KANSAS CITY, MISSOURI**

**Superfund Technical Assessment and Response Team (START) 3 Contract
Contract No. EP-S7-06-01, Task Order 0002.015.022**

Prepared For:

U.S. Environmental Protection Agency
Region 7
Superfund Division
11201 Renner Boulevard
Lenexa, Kansas 66219

January 17, 2013

Prepared By:

Tetra Tech, Inc.
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Region 7 Superfund Program
Addendum to the QAPP for Superfund Integrated Site Assessment and Targeted Brownfields Assessment Activities (October 2012)
for the Municipal Farms – Animal Shelter Site

Project Information:

Project Name: Municipal Farms – Animal Shelter Site		City: Kansas City	State: MO
EPA Project Manager: Todd Davis		START Project Manager: Kaitlyn Bahr	
Approved By: <i>Kaitlyn Bahr</i>	Title: START Project Manager	Date: 1/17/13	Prepared For: EPA Region 7 Superfund Division
Approved By: <i>Joe Davis</i>	Title: START Program Manager	Date: 1/17/13	
Approved By: <i>Kathy Homer</i>	Title: START QA Manager	Date: 1/17/13	
Approved By:	Title: EPA Project Manager	Date:	Prepared By: Kaitlyn Bahr
Approved By:	Title: EPA Region 7 QA Manager	Date:	Date: January 2013
			Tetra Tech START Project Number: X9004.06.0002.015.022

1.0 Project Management:

1.1 Distribution List

EPA—Region 7:	Todd Davis, EPA Project Manager	Tetra Tech START:	Kaitlyn Bahr, Project Manager
	Diane Harris, EPA Region 7 QA Manager		Kathy Homer, QA Manager

1.2 Project/Task Organization

Todd Davis, of the EPA Region 7 Superfund Division, will serve as the EPA Project Manager for the activities described in this QAPP. Kaitlyn Bahr, of Tetra Tech, Inc. (Tetra Tech) will serve as the START Project Manager for field activities.

1.3 Problem Definition/Background:

Description: This site-specific Quality Assurance Project Plan form is prepared as an addendum to the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated October 2012), and contains site-specific data quality objectives for the sampling activities described herein.

- ☒ Description attached.
☐ Description in referenced report: _____

Title
Date

1.4 Project/Task Description:

- | | | | |
|--|---|--|---|
| <input type="checkbox"/> CERCLA PA | <input type="checkbox"/> CERCLA SI | <input checked="" type="checkbox"/> Brownfields Assessment | <input type="checkbox"/> Removal Action |
| <input type="checkbox"/> Other (description attached): | <input type="checkbox"/> Pre-CERCLIS Area Screening | <input type="checkbox"/> Removal Site Evaluation | |

Other Description:

Schedule: The Limited Phase II Targeted Brownfields Assessment (TBA) is scheduled to begin in February 2013 and is anticipated to take up to 1 week to complete.

- ☐ Description in referenced report: _____

Title
Date

1.5 Quality Objectives and Criteria for Measurement Data:

- | | |
|------------------------|---|
| a. Accuracy: | <input checked="" type="checkbox"/> Identified in attached table. |
| b. Precision: | <input checked="" type="checkbox"/> Identified in attached table. |
| c. Representativeness: | <input checked="" type="checkbox"/> Identified in attached table. |
| d. Completeness*: | <input checked="" type="checkbox"/> Identified in attached table. |
| e. Comparability: | <input checked="" type="checkbox"/> Identified in attached table. |

Other Description:

*A completeness goal of 100 percent has been established for this project. However, if the completeness goal is not met, EPA may still be able to make decisions based on any or all of the remaining validated data.

1.6 Special Training/Certification Requirements:

- ☒ OSHA 1910 ☒ Special Equipment/Instrument Operator (describe below): ☐ Other (describe below):

Sampling personnel will be experienced in Geoprobe® operation and in the collection of soil and groundwater samples.

1.7 Documentation and Records:

- | | | | | |
|--|--|---|---|--------------------------------|
| <input checked="" type="checkbox"/> Field Sheets | <input checked="" type="checkbox"/> Daily Log | <input type="checkbox"/> Trip Report | <input checked="" type="checkbox"/> Area Maps | <input type="checkbox"/> Video |
| <input checked="" type="checkbox"/> Chain of Custody | <input checked="" type="checkbox"/> Health and Safety Plan | <input checked="" type="checkbox"/> Letter Report | <input checked="" type="checkbox"/> Photos | |
- ☒ Sample documentation will follow EPA Region 7 SOP 2420.05.
- ☒ Other: Analytical information will be handled according to procedures identified in Table 2.

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2.0 Measurement and Data Acquisition:

2.1 Sampling Process Design:

- | | | | |
|--|---|--|---|
| <input type="checkbox"/> Random Sampling | <input type="checkbox"/> Transect Sampling | <input checked="" type="checkbox"/> Biased/Judgmental Sampling | <input type="checkbox"/> Stratified Random Sampling |
| <input type="checkbox"/> Search Sampling | <input type="checkbox"/> Systematic Grid | <input type="checkbox"/> Systematic Random Sampling | <input checked="" type="checkbox"/> Definitive Sampling |
| <input type="checkbox"/> Screening w/o Definitive Confirmation | <input type="checkbox"/> Screening w/ Definitive Confirmation | | |
| <input checked="" type="checkbox"/> Sample Map Attached | | | |

- ☒ Other (Provide rationale behind each sample): See Attachment A for additional sampling information.

The proposed sampling scheme will incorporate judgmental methods with definitive laboratory analysis, in accordance with the *Guidance for Performing Site Inspections Under CERCLA*, OSWER Directive #9345.1-05, September 1992. Judgmental sampling is the subjective (based) selection of sampling locations based on historical information, visual inspection, and the best professional judgment of the sampler(s).

See Attachments A and B for additional site-specific information and maps.

Sample Summary Location	Matrix	# of Samples*	Analysis
Animal Shelter Site – 4400 Raytown Road	Structural material	50	Asbestos, by Polarized Light Microscopy (PLM)
Animal Shelter Site – 4400 Raytown Road	Structural material	6	Asbestos, by 400 Point Count
Animal Shelter Site – 4400 Raytown Road Surfaces (field Screening)	Paint-covered surfaces	40	Total Lead by Field Screening with Portable XRF (Used On Site)
On-site surface soil locations	Soil	4	VOCs, SVOCs, Priority Pollutant Metals, TPH-GRO, TPH-DRO, TPH-ORO, Pesticides, Herbicides, Warfarin
On-site Geoprobe® temporary monitoring wells	Groundwater	4	VOCs, SVOCs, dissolved Priority Pollutant Metals, TPH-GRO, TPH-DRO, TPH-ORO, Pesticides, Herbicides, Total Suspended Solids (TSS)
On-site	Soil	1	Soil type classification

*NOTE: Quality control (QC) samples are not included with these totals. See Table 1 for a complete sample summary.

2.2 Sample Methods Requirements:

Matrix	Sampling Method	EPA SOP(s) or other Method
Structural Material (Asbestos)	Bulk samples will be collected using techniques appropriate for the suspect building material. A coring device will be used to sample interior wall locations.	SOP 4231.2015
Paint-covered Surfaces (Lead)	An XRF analyzer will be used to screen paint-covered surfaces. At approximately 10 percent of those locations, paint chips will be collected for laboratory confirmation analysis for lead. Paint chip samples collected from paint-covered surfaces will be transferred to the appropriate sample containers.	SOPs 4231.1707 and 4231.2011
Groundwater	Groundwater samples will be collected from Geoprobe® temporary monitoring wells. These groundwater samples will be collected through Geoprobe® rods via disposable polyethylene tubing and a peristaltic pump or check valve.	SOPs 4230.07 and 4231.2007
Surface soil	Surface soil samples will be collected with a stainless steel spoon from a depth of 0 to 6 inches below ground surface (bgs).	SOPs 4231.2012; Method 5035
Soil	Soil classification sample will be collected at a depth of at least 10 feet bgs or directly above bedrock, whichever is encountered first and will be placed directly into the laboratory supplied container.	ASTM D422-63

- ☐ Other Description:

2.3 Sample Handling and Custody Requirements:

- ☒ Samples will be packaged and preserved in accordance with procedures defined in Region 7 EPA SOP 2420.06.
- ☒ COC will be maintained as directed by Region 7 EPA SOP 2420.04.
- ☐ Samples will be accepted according to Region 7 EPA SOP 2420.01.
- ☒ Other (Describe): Samples submitted to a START-contracted laboratory will be accepted in accordance with procedures established by the laboratory.

2.4 Analytical Methods Requirements:

- ☒ Identified in attached table.
- ☒ Rationale: The requested analyses have been selected based on historical information about the site and program experience with similar types of sites.
- ☐ Other (Describe):

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2.5 Quality Control Requirements:

- ☐ Not Applicable
- ☒ Identified in attached table.
- ☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated October 2012).
- ☒ Field QC Samples: For this investigation, one field blank (water) will be prepared with distilled, deionized (DI) water provided by the START-contracted laboratory. The field blank will be collected to evaluate contamination of sampling containers and/or preservatives, and to assess contamination potentially introduced during the sampling and laboratory procedure(s). One equipment rinsate blank will be prepared with DI water provided by the START-contracted laboratory. The equipment rinsate will evaluate the effectiveness of decontamination procedures for Geoprobe® sampling equipment. In addition, one soil trip blank and one water trip blank will be prepared by the START-contracted laboratory to evaluate contamination introduced during transportation of the containers/samples. The QC samples will be submitted for the analyses listed in the attached tables. Evaluation of blank samples depends on the levels of contamination found in environmental samples to determine whether the environmental samples are representative. Analytical results of the blank samples will be evaluated on a qualitative basis by the EPA project manager and EPA contractor(s) to determine a general indication of field-introduced and/or lab-introduced contamination. Because evaluation for total method precision is not necessary for this project, no field duplicates will be collected.
- ☐ Other (Describe):

2.6 Instrument/Equipment Testing, Inspection, and Maintenance Requirements:

- ☐ Not Applicable
- ☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated October 2012).
- ☒ Testing, inspection, and maintenance of analytical instrumentation will proceed in accordance with the previously referenced SOPs and/or manufacturers' recommendations. Testing, inspection, and maintenance of field instruments will proceed in accordance with manufacturers' recommendations.

2.7 Instrument Calibration and Frequency:

- ☐ Not Applicable
- ☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated October 2012).
- ☒ Calibration of laboratory equipment will be performed as described in the previously referenced SOPs and/or manufacturers' recommendations.
- ☒ Other (Describe): Calibration of field instruments (PID, etc.) will be conducted in accordance with manufacturers' recommendations.

2.8 Inspection/Acceptance Requirements for Supplies and Consumables:

- ☐ Not Applicable
- ☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated October 2012).
- ☒ All sample containers will meet EPA criteria for cleaning procedures for low-level chemical analysis. Sample containers will have Level II certifications provided by the manufacturer in accordance with pre-cleaning criteria established by EPA in *Specifications and Guidelines for Obtaining Contaminant-Free Containers*.
- ☐ Other (Describe):

2.9 Data Acquisition Requirements:

- ☐ Not Applicable
- ☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated October 2012).
- ☒ Previous data or information pertaining to the area (including other analytical data, reports, photos, maps, etc., that are referenced in this QAPP) has been compiled by EPA and/or its contractor(s) from other sources. Some of that data has not been verified by EPA and/or its contractor(s); however, that unverified information will not be used for decision-making purposes by EPA without verification by an independent professional qualified to verify such data or information.
- ☐ Other (Describe):

2.10 Data Management:

- ☐ All laboratory data acquired will be managed in accordance with Region 7 EPA SOP 2410.01.
- ☒ Other (Describe): Laboratory data acquired by the START-contracted laboratory will be managed in accordance with procedures established by the laboratory.

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3.0 Assessment and Oversight:

3.1 Assessment and Response Actions:

- ☒ Peer Review ☒ Management Review ☐ Field Audit ☐ Lab Audit
☐ Assessment and response actions pertaining to analytical phases of the project are addressed in Region 7 EPA SOPs 2430.06 and 2430.12.
☒ Other (Describe): Assessment and response actions pertaining to analytical phases of the project will be in accordance with procedures established by the START-contracted laboratory (to be determined).

3.1A Corrective Action:

- ☒ Corrective actions will be at the discretion of the EPA Project Manager whenever problems appear that could adversely affect data quality and/or resulting decisions affecting future response actions pertaining to the area.
☐ Other (Describe):

3.2 Reports to Management:

- ☐ Audit Report ☒ Data Validation Report ☐ Project Status Report ☐ None Required
☒ A letter report describing the sampling techniques, locations, problems encountered (with resolutions to those problems), and interpretation of analytical results will be prepared by START and submitted to the EPA.
☒ Reports will be prepared in accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated October 2012).
☐ Other (Describe):

4.0 Data Validation and Usability:

4.1 Data Review, Validation, and Verification Requirements:

- ☐ Identified in attached table.
☒ Data review and verification will be performed in accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated October 2012).
☐ Data review and verification will be performed by a qualified analyst and the laboratory's section manager as described in Region 7 EPA SOPs 2430.06, 2430.12, and 2410.10.
☒ Other (Describe): The analytical data package will be validated internally by the contracted laboratory in accordance with the laboratory's established SOPs. A Tetra Tech chemist will conduct an external verification and validation of the laboratory data package using a method consistent with a Stage 2B validation, as described in the EPA Contract Laboratory Program (CLP) Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use (EPA 2009). A Stage 2B validation includes verification and validation based on completeness and compliance check of sample receipt conditions and sample-related and instrument-related QC results. The EPA Project Manager will be responsible for overall validation and final approval of the data, in accordance with the projected use of the results.

4.2 Validation and Verification Methods:

- ☐ Identified in attached table.
☐ The data will be validated in accordance with Region 7 EPA SOPs 2430.06, 2430.12, and 2410.10.
☒ The EPA Project Manager will inspect the data to provide a final review. The EPA Project Manager will review the data, if applicable, for laboratory spikes and duplicates, laboratory blanks, and field QC samples to ensure the data are acceptable. The EPA Project Manager will also compare the sample descriptions with the field sheets for consistency, and will ensure appropriate documentation of any anomalies in the data.
☒ Other (Describe): If any problems with field measurements or analytical data are identified by Tetra Tech's data verification/validation, the Tetra Tech Project Manager will verbally, and in writing if requested by EPA, explain the circumstances of the failure, describe any corrective action taken, and provide an opinion on the limitations and usefulness of the data to the EPA Project Manager.

4.3 Reconciliation with User Requirements:

- ☒ If data quality indicators do not meet the project's requirements as outlined in this QAPP, the data may be discarded and re-sampling or re-analysis of the subject samples may be required by the EPA Project Manager.
☐ Other (Describe):

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Table 1: Sample Summary							
Project Name: Municipal Farms – Animal Shelter Site				Location: Kansas City, Missouri; See Attachment B, Figure 1			
Project Manager: Kaitlyn Bahr				Activity/ASR #: To be determined			Date: January 2013
No. of Samples	Matrix	Location	Purpose	Depth or other Descriptor	Requested Analysis	Sampling Methods	Analytical Method
50	Structural Material	On-site structures	To quantify asbestos in building materials	Bulk material from walls, ceilings, and on pipes	Asbestos by PLM	4231.2015	Method 600/R-93/116
6	Structural Material	On-site structures	To quantify asbestos in building materials	Bulk material from floors, walls, ceilings, and on pipes	Asbestos by Point Count	4231.2015	Method 600/R-93/116
40	Paint-Covered Surfaces	On-site structures, paint-covered surfaces	To quantify lead in paint on structures	Paint-covered surfaces	Total Lead by XRF Screening	4231.1707	Field Screening
4	Surface soil	Suspected source areas	To assess potential surface soil contamination from site operations	0 to 6 inches bgs	VOCs, SVOCs, Priority Pollutant Metals, TPH-GRO, TPH-DRO, TPH-ORO, Pesticides, Herbicides, Warfarin	EPA SOPs 4230.07, 4230.03, & 4231.2012; EPA Method 5035	Methods: SW-846 8260C, 8270, 6020, 7471B, 8081, and 8151, LC/MS/MS 8321
4	Groundwater	On-site Geoprobe® temporary monitoring wells	To assess potential groundwater contamination from site operations	Directly below the water table	VOCs, SVOCs, Dissolved Priority Pollutant Metals, TPH-GRO, TPH-DRO, TPH-ORO, Pesticides, Herbicides, TSS	EPA SOPs 4230.07 & 4230.15	Methods: EPA SW-846 8260C, 8270, 6010, 7470, 8081, 8151 and 160.2
1	Soil	On-site Geoprobe® boring locations	To determine soil classification	From at least 10 feet bgs or directly above bedrock	Soil Classification	ASTM D422-63	ASTM D422-63
QC Samples							
6	Structural Material	Field duplicate - On-site structures	To assess the precision of analytical and sampling methods	Bulk material from walls, ceilings, and on pipes	Asbestos by PLM	4231.2015	Method 600/R-93/116
4	Paint-Covered Surfaces	On-site structures, paint-covered surfaces	Confirmation samples to verify XRF data	Paint-covered surfaces	Lead Chip	4231.2011	EPA Method 7420
1	Water	Rinsate Blank	To evaluate effectiveness of decontamination procedures for Geoprobe® sampling equipment	NA	VOCs, SVOCs, RCRA Metals, TPH-GRO, TPH-DRO, TPH-ORO, Pesticides, Herbicides	NA	Methods: 8260C, 8270, 6010, 7470, 8081, 8151
1	Water	Field Blank	To assess field-introduced and laboratory-derived contamination	NA	VOCs, SVOCs, RCRA Metals, TPH-GRO, TPH-DRO, TPH-ORO, Pesticides, Herbicides	NA	Methods: 8260C, 8270, 6010, 7470, 8081, 8151
1	Water	Trip Blank	To assess transportation-related contamination	NA	VOCs	NA	Method 8260C
1	Soil	Trip Blank	To assess transportation-related contamination	NA	VOCs	NA	Method 8260C

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Table 2: Data Quality Objective Summary						
Project Name: Municipal Farms –Animal Shelter Site				Location: Kansas City, Missouri; See Attachment B, Figure 1		
Project Manager: Kaitlyn Bahr				Activity/ASR #: To be determined		Date: January 2013
Analysis	Analytical Method	Data Quality Measurements				
		Accuracy	Precision	Representativeness	Completeness	Comparability
Structural Material						
Asbestos by PLM	See Table 1	Per analytical method	Per analytical method	Biased/judgmental sampling based on professional judgment of the sampling team	100%; no critical samples identified.	Standardized procedures for sample collection and analysis will be used.
Paint-covered Surfaces						
Lead	See Table 1	Per analytical method	Per analytical method	Biased/judgmental sampling based on professional judgment of the sampling team	100%; no critical samples identified	Standardized procedures for sample collection and analysis will be used.
Soil						
VOCs, SVOCs, Priority Pollutant Metals, TPH-GRO, TPH-DRO, TPH-ORO, Pesticides, Herbicides, Warfarin	see Table 1	per analytical method	per analytical method	Judgmental sampling, based on professional judgment of the sampling team	100%; no critical samples have been defined	Standardized procedures for sample collection and analysis will be used.
Groundwater						
VOCs, SVOCs, Priority Pollutant Metals, TPH-GRO, TPH-DRO, TPH-ORO, Pesticides, Herbicides, TSS	see Table 1	per analytical method	per analytical method	Judgmental sampling, based on professional judgment of the sampling team	100%; no critical samples have been defined	Standardized procedures for sample collection and analysis will be used.

ATTACHMENT A

**SITE-SPECIFIC INFORMATION REGARDING THE MUNICIPAL FARMS – ANIMAL
SHELTER SITE**

INTRODUCTION

The Tetra Tech, Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) has been tasked by the U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division to conduct a Limited Phase II Targeted Brownfields Assessment (TBA) at the Municipal Farms – Animal Shelter site (site) in Kansas City, Missouri. The primary purpose of the investigation is to determine whether past site operations have resulted in releases of hazardous contaminants to the soil and groundwater.

The scope of the TBA will include (1) an inspection of on-site structures for presence of asbestos-containing building materials (ACBM) and lead-based paint (LBP), (2) an inventory of product containers holding hazardous materials (such as cleaning supplies, paint, etc.), (3) surface soil sampling, and (4) groundwater sampling for potential contamination, and (5) soil classification sampling. All suspected ACBM will be sampled to characterize and quantify the material; paint-covered surfaces will be screened with an x-ray fluorescence (XRF) spectrometer to quantify any detected presence of LBP. The TBA will be completed in accordance with industry standard practice for Phase II Environmental Site Assessments.

This quality assurance project plan (QAPP) identifies site-specific features and addresses elements of the sampling strategy and analytical methods proposed for this Phase II TBA. An assessment of the data acquired will be conducted to determine if additional response is warranted.

SITE DESCRIPTION AND BACKGROUND

The site is an approximately approximately 1.9-acre tract of land at 4400 Raytown Road in Kansas City, Jackson County, Missouri (see Figure 1, Attachment B). According to the City of Kansas City, Missouri KC Mapper website, the property description for the tract of land that encompasses the site is “Sec 30-49-32 NW ¼, all that pt of NW ¼ ly E of Eastern Avenue and North of Ozark Road and swly of Raytown Road (ex W 180 thof)” (City of Kansas City [City] 2012). The subject property is depicted on the United States Geological Survey (USGS) 7.5-minute series Independence, Missouri topographic quadrangle map (USGS 1996) in northwest ¼, Section 30, Township 49 north, Range 32 west. The coordinates at the approximate center of the property are 39° 2’ 26” north latitude and 94° 29’ 37.68” west longitude (Google Earth 2012).

SITE HISTORY/INVESTIGATIONS

The site is currently an occupied animal shelter, a paved driveway from Raytown Road leads to the site, a paved parking lot is located on the north and west side of the site buildings and a paved driveway circles

the buildings. There are three buildings located at the site encompassing approximately 12,000 square feet.

Aerial photographs show the site as agricultural land or green space until 1955 when it shows the site developed as an animal shelter. According to city directories, the site was developed as an animal shelter as early as 1951.

The animal shelter is located on 1.9 acres of land on the south side of Raytown Road. The City of Kansas City Health Emergency Hazmat Site (HEHS) is southeast of the site. The HEHS was used from the mid 1980s to 1993 to store hazardous substances, but this site was not permitted or equipped for these activities. This storage took place in two structures historically associated with the Municipal Farm. The HEHS was closed in 1993 after an inspection by the Missouri Department of Natural Resources (MDNR). A consent decree was issued specifying cleanup requirements and limiting future use of the site to industrial/commercial use, leading to a deed restriction on the property (City 2009).

Contaminants of concern at the site are primarily herbicide and pesticide applications, vehicle and machinery maintenance, storage tanks, hazardous waste storage at HEHS, rodenticides, and other Municipal Farm activities (Tetra Tech 2012).

SAMPLING STRATEGY AND METHODOLOGY

The sampling activities are tentatively scheduled to begin in February 2013 and will require approximately 2 days to complete. Proposed sampling locations are shown on Figure 2 in Attachment B. The laboratory data obtained for all samples collected during this project will be compared to the Missouri Risk-Based Corrective Action (MRBCA) Tier 1 Risk-Based Target Levels (RBTL) to assess whether further response is warranted. Descriptions of proposed samples to be collected for this Phase II TBA are as follows.

Structural Materials Sampling for Asbestos

Bulk samples will be collected from accessible building materials suspected to contain asbestos. Selection of sampling locations (approximately 50) will be based on a site inspection by START. Asbestos samples will be collected in accordance with National Emissions Standards for Hazardous Air Pollutants (NESHAP) as adopted by EPA, and the Asbestos Hazard and Emergency Response Act of 1986 (AHERA) protocols. AHERA defines ACBM as any building material or product that contains more than 1 percent (%) asbestos. Suspected ACBM will be grouped as homogeneous areas if the material is similar in appearance and texture; however, if the inspector decides that a material (for

example, wall texturing) is not similar in appearance and texture to other materials in the building, the inspector will distinguish the material as unique and collect samples of each unique material accordingly.

Bulk samples of suspected ACBM will be collected to ensure that each distinct layer of material is represented in the sample. Bulk samples will be collected with sampling devices appropriate for the suspect building materials. A coring device will be used to collect interior and exterior wall and roof samples. A wetting agent will be applied to friable surfaces prior to sample collection to reduce the potential for fiber release. All samples collected will be placed in plastic bags, labeled, and sealed immediately upon collection. To prevent cross-contamination between samples, the sampling instruments will be wiped clean using a wet, lint-free cloth after collection of each sample. A unique sample identification number will be assigned to each sample. All samples will be submitted to a START-contracted laboratory for analysis for asbestos by polarized light microscopy (PLM) by EPA Method 600. Split samples will be collected at approximately 10 percent of the bulk sample locations and will be submitted to a second contracted laboratory for analysis for asbestos by PLM for quality control (QC)/quality assurance (QA). All samples will be handled and analyzed according to SOPs and methods referenced in the QAPP form.

Lead-Based Paint Screening

Tetra Tech will make every effort to inspect all areas of the subject property building. HUD *Guidelines for the Evaluation and Control of LBP in Housing* (1997) suggests that paint applied before 1978 could contain lead.

An XRF screening of suspected LBP will proceed according to protocols similar to the single-family housing inspection procedures in the HUD *Guidelines*. Tetra Tech will utilize an XT-260 XRF Spectrum Analyzer manufactured by Innov-X to perform the LBP testing. The XT-260 is a state-of-the-art XRF spectrum analyzing system for quantitative measurement of lead in paint on various substrates. Tetra Tech will perform XRF testing of suspect painted surfaces that possibly would be impacted during redevelopment activities.

Tetra Tech will utilize the XRF “Lead Paint Mode” for testing, standardized per the equipment instruction manual, and program the unit with an action level of 1.0 milligram per square centimeter (mg/cm²). The XT-260 automatically adjusts the measurement time to the least time needed for a definitive measurement based on the action level. Paint containing greater than or equal to 1.0 mg/cm² lead by XRF testing is considered LBP.

Tetra Tech will perform XRF calibration checks on the XT-260 according to Innov-X's recommended protocol and the HUD *Guidelines*. These QC readings are used to monitor the performance of the XT-260. The calibration-check readings will be taken after every 2 hours of operation using a Standard Reference Material (SRM) paint film, developed by the National Institute of Standards and Technology (NIST).

Approximately 10 percent of the XRF screening locations will be selected for collection of samples for confirmation laboratory analysis for total lead (selected locations based on the professional judgment of the field team). A 2-square-inch square template will be used to accurately measure the sample size. The template will be placed on the painted surface where the paint is observed. While held in place manually, the template will be outlined with a permanent marker. A clean piece of paper will be taped to the bottom of the template to create a funnel effect. The paint inside the template area will be scraped off using a putty knife. To prevent cross-contamination between samples, the sampling instruments will be wiped clean using a wet, lint-free cloth after collection of each sample. A unique sample identification number will be assigned to each sample. The paint chip samples will be collected in hard plastic containers, labeled, and sealed immediately upon collection. They will be sent to an Environmental Lead Laboratory Accreditation Program (ELLAP)-certified laboratory for analysis for total lead by EPA Method 7420.

Hazardous Materials Inventory

START will conduct a room-to-room search of the building to identify hazardous materials, including mercury containing thermostats, fluorescent light ballasts potentially containing PCBs, caulking material possibly containing PCBs, product containers of hazardous materials (such as cleaning supplies, paints, etc.), and any other materials that may need to be removed during renovation of the facility. Every effort will be made to provide a complete inventory of these items. No sampling of these materials will occur.

Groundwater – Tetra Tech will collect groundwater samples from up to four Geoprobe® temporary monitoring wells. The Geoprobe® temporary monitoring wells will be placed along the northern property boundary. These samples will be collected with a Screen Point 15 sampling apparatus containing a disposable 4-foot-long polyvinyl chloride (PVC) screen. At each location, the screen will be deployed directly below the water table, and a sample will be collected through disposable polyethylene tubing with either a peristaltic pump or using a check valve placed at the bottom of the tubing.

The following information will be recorded in a logbook for each temporary monitoring well location: purge times or estimated purge volumes, exact sample locations (depths and Global Positioning System [GPS] coordinates), and analyses to be performed. The groundwater samples will be submitted to the

START contracted laboratory for analyses for volatile organic compounds (VOC), semi-volatile organic compounds (SVOC), total petroleum hydrocarbons (TPH)-gasoline range organics (GRO), TPH-diesel range organics (DRO), TPH-oil range organics (ORO), herbicides, pesticides, priority pollutant metals (dissolved, including mercury). One groundwater sample will also be analyzed for total suspended solids (TSS). Groundwater samples collected for analysis for VOCs will be collected into two 40-milliliter vials preserved with hydrochloric acid (HCl) to a pH <2. The TPH-GRO samples will be collected in two unpreserved 40-milliliter vials. Water samples submitted for analyses for herbicides, pesticides, SVOCs, TPH-DRO, TPH-ORO and TSS will be collected in laboratory supplied containers. Water samples for RCRA metals analysis will be collected in a laboratory supplied container and preserved with nitric acid (HNO₃) to a pH <2. These samples will be filtered in the field for analysis for dissolved metals. All water samples will be stored in coolers maintained at or below 4 degrees Celsius (°C) pending submittal to START-contracted laboratory.

Surface soil – Soil samples will be collected from up to three locations around the existing buildings and one near a disturbed area west of the buildings to assess the impact of site activities on surface soils (see Figure 3, Attachment B). Five aliquot samples will be collected from each of the locations. At each sample location where detection of noticeable staining and/or VOCs using a PID occurs, sampling will follow via EPA Method 5035 guidelines for VOCs and TPH-GRO. The remaining soil will be placed in a disposable aluminum pie pan for homogenization, and then transferred to appropriate containers. Each grab soil sample will be collected using a dedicated sampling spoon or hand auger from 0 to 6 inches bgs. These containers will be submitted for analyses for TPH-DRO, TPH-ORO, SVOCs, priority pollutant metals (including mercury), herbicides, pesticides, and warfarin.

Pertinent data, including analyses to be performed and exact sample locations (GPS coordinates), will be recorded in the field logbook for each sample. All soil samples will be stored in coolers maintained at temperatures at or below 4°C pending submittal to a START-contracted laboratory.

Soil classification – START will also collect a soil sample from the site in an area expected to be free from contamination but representative of the soils within the site in order to classify the soil type based on grain size. This sample will be collected concurrently with the soil sample collected west of the subject property. The soil classification sample will be collected at a depth of at least 10 feet bgs or directly above bedrock, whichever is encountered first. It is assumed that only one soil type will be encountered. This information would be used to help determine the appropriate Tier 1 risk-based target levels under the current MRBCA model if contaminants are found at the site.

QUALITY CONTROL

START will collect approximately six (10%) duplicate bulk asbestos samples to send to a subcontracted NVLAP-certified laboratory for asbestos analysis by PLM. Approximately three (10 %) of the XRF screening locations will be selected for confirmation sampling (based on the professional judgment of the START field team). Paint chip samples will be collected with putty knives and placed into hard shell containers. Non-dedicated sampling equipment will be decontaminated following sampling at each location. The paint chip samples will be sent to an ELLAP-certified laboratory for lead analysis by EPA Method 7420 and confirmation of XRF screening results. To evaluate sample quality control (QC), a water field blank, water trip blank, equipment rinsate blank, and a soil trip blank will be collected, as specified in Section 2.5 of the QAPP form.

Investigation-derived waste (IDW), consisting primarily of used tubing, gloves, etc., will be disposed of as uncontaminated solid waste. Purge water and soil cuttings will be disposed of on-site as non-hazardous waste. Issues pertaining to decontamination of personnel and sampling equipment will be addressed in a site-specific Health and Safety Plan (HASP) prepared by START.

ANALYTICAL METHODS

All samples will be submitted to a START-contracted laboratory for analysis. The soil and groundwater samples will be analyzed for VOCs, SVOCs, RCRA metals (including mercury), TPH-GRO, TPH-DRO, TPH-ORO, pesticides and herbicides. Surface soils will also be analyzed for warfarin by method Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) 8321. Groundwater samples will be filtered in the field and submitted for analyses for dissolved (filtered) metals. All samples will be analyzed according to Standard Operating Procedures (SOP) and methods specified on the QAPP form. START has selected a laboratory whose analytical detection limits are below the applicable MRBCA default target levels for all the analytes. Appropriate containers and physical/chemical preservation techniques will be employed during the field activities to help verify that representative analytical results are obtained. Samples will be submitted to the laboratory in February 2013.

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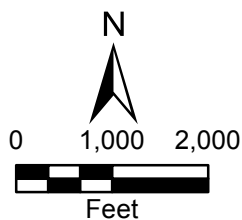
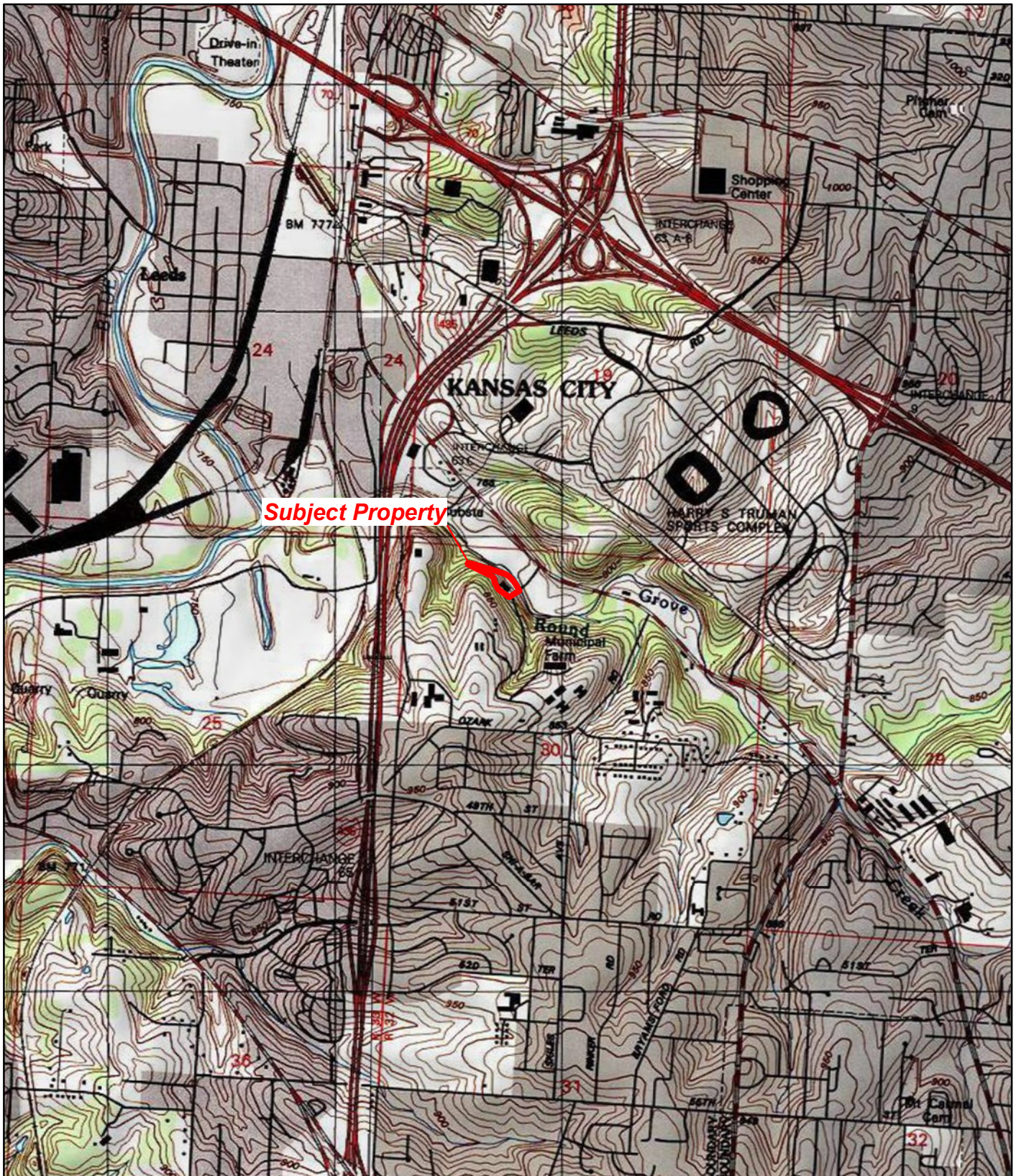
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ATTACHMENT B

FIGURES



Kansas City Municipal Farms - Animal Shelter
4400 Raytown Road
Kansas City, Missouri

Figure 1
Site Location Map



Source: USGS Independence, MO 7.5 Minute Topo Quad, 1996
USGS Kansas City, MO 7.5 Minute Topo Quad, 1996

Date: 11/6/12

Drawn By: Nick Wiederholt

Project No: X9004.L.06.0002.015.022



Legend

- Major road
- Street
- Stream/River
- Approximate subject property boundary
- HEHS Health Emergency Hazmat Site

Source: ArcGIS Online, Bing Maps Hybrid, 2012; HSIP Gold, 2007

Kansas City Municipal Farms - Animal Shelter
4400 Raytown Road
Kansas City, Missouri

Figure 2 Site Layout Map



Date: 12/21/12

Drawn By: Nick Wiederholt

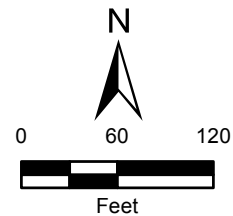
Project No: X9004.L.06.0002.015.022

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Legend

- Proposed DPT groundwater sample location
- Proposed soil classification sample location
- ▲ Proposed surface soil sample location
- Stream/River
- Approximate subject property boundary
- DPT Direct push technology



Kansas City Municipal Farms - Animal Shelter
4400 Raytown Road
Kansas City, Missouri

Figure 3
Proposed Sample Location Map



Date: 1/9/13

Drawn By: Nick Wiederholt

Project No: X9004.L06.0002.015.022