



February 9, 2018

Mr. Todd Davis  
EPA On-Scene Coordinator  
U.S. Environmental Protection Agency, Region 7  
11201 Renner Boulevard  
Lenexa, Kansas 66219

**Subject: Quality Assurance Project Plan for a Phase II Targeted Brownfields Assessment  
Hiland Roberts Dairy St. Joseph – St. Joseph, Buchanan County, Missouri  
U.S. EPA Region 7, START 4, Contract No. EP-S7-13-06, Task Order No. 0002.049  
Task Monitor: Todd Davis, EPA On-Scene Coordinator**

Dear Mr. Davis:

Tetra Tech, Inc. (Tetra Tech) is submitting the attached Quality Assurance Project Plan (QAPP) for the Hiland Roberts Dairy St. Joseph site in St. Joseph, Missouri. If you have any questions or comments, please contact the Project Manager at (816) 412-1745.

Sincerely,

A handwritten signature in black ink that reads 'Kirk Mammoliti'.

Kirk Mammoliti  
START Project Manager

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

Ted Faile, PG, CHMM  
START Program Manager

Enclosures

cc Debra Dorsey, START Project Officer (cover letter only)  
Whitney Bynum, Targeted Brownfields Assessment Program

**QUALITY ASSURANCE PROJECT PLAN  
PHASE II TARGET BROWNFIELDS ASSESSMENT**

**HILAND ROBERTS DAIRY ST. JOSEPH  
ST. JOSEPH, BUCHANAN COUNTY, MISSOURI**

**Superfund Technical Assessment and Response Team (START) 4 Contract  
Contract No. EP-S7-13-06, Task Order 0002.049**

Prepared For:

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

February 9, 2018

Prepared By:

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**1.6 Special Training/Certification Requirements:**

- OSHA 1910
- Special Equipment/Instrument Operator: Geoprobe® operation and sampling will be conducted by experienced and licensed personnel.
- Other (describe below):

**1.7 Documentation and Records:**

- Field Sheets       Site Log       Trip Report       Site Maps       Video
- Chain of Custody       Health and Safety Plan       Letter Report       Photos
- Sample documentation will follow EPA Region 7 SOP 2420.05.
- Other: Analytical information will be handled according to procedures identified in Table 2.

**2.0 Measurement and Data Acquisition:**

**2.1 Sampling Process Design:**

- Random Sampling       Transect Sampling       Biased/Judgmental Sampling       Stratified Random Sampling
- Search Sampling       Systematic Grid       Systematic Random Sampling       Definitive Sampling
- Screening w/o Definitive Confirmation       Screening w/ Definitive Confirmation
- Sample Map Attached

The proposed sampling scheme for this project will be judgmental, in accordance with the *Guidance for Performing Site Inspections Under CERCLA*, Office of Solid Waste and Emergency Response (OSWER) Directive #9345.1-05, September 1992, and *Removal Program Representative Sampling Guidance, Volume 1: Soil*, OSWER Directive 9360.4-10, November 1991. In addition, analytical methods will follow the Missouri Department of Natural Resources (MDNR) Missouri Risk-based Corrective Action (MRBCA) Process for Petroleum Storage Tanks, October 2013. All samples will be submitted for analysis to a START-contracted laboratory. Judgmental sampling is subjective selection of sampling locations based on historical information, visual inspection, and best professional judgment of sampler(s). See Appendices A, B, and C for additional site-specific information and figures.

A summary of anticipated maximum numbers of samples to be collected for laboratory analysis is as follows. The proposed numbers of samples represent a balance between cost and coverage, and a reasonable attempt to meet study objectives while staying within the budget constraints of a typical Brownfields Assessment.

Sample Summary Location	Matrix	# of Samples*	Analysis
On-site Geoprobe® direct-push technology (DPT) temporary wells	Groundwater	3	Arsenic, barium, cadmium, chromium, lead, and selenium (dissolved)
On-site Geoprobe® soil borings	Soil	12	Volatile organic compounds (VOC), oxygenates, total petroleum hydrocarbons (TPH) – gasoline range organics (GRO), TPH – diesel range organics (DRO), TPH – oil range organics (ORO), polycyclic aromatic hydrocarbons (PAH), arsenic, barium, cadmium, chromium, lead, and selenium

\* Background/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)/Methods
Groundwater	At Geoprobe® temporary wells, groundwater samples will be collected through polyethylene tubing fitted with a check valve that will be inserted into a Screen Point 16 sampling apparatus containing a disposable polyvinyl chloride (PVC) or reusable stainless steel screen.	SOPs 4230.07 & 4231.2007
Soil	Soil samples will be collected by use of a Geoprobe® direct-push apparatus, using Macro-Core samplers fitted with disposable PVC liners; the samples then will be transferred to the appropriate sample containers.	SOPs 4230.07 & 4231.2012; Method 5035

**2.3 Sample Handling and Custody Requirements:**

- Samples will be packaged and preserved in accordance with procedures defined in Region 7 EPA SOP 2420.06C.
- 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 according to its established procedures.

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**2.4 Analytical Methods Requirements:**

- Identified in attached table.
- Identified in attached Analytical Services Request (ASR) Form
- Other (Describe):

**2.5 Quality Control Requirements:**

- Not Applicable
- Identified in attached table.
- In accordance with the **Generic QAPP for the Superfund Site Assessment and TBA Programs (October 2017)**.
- Describe Field QC Samples to be collected: One equipment rinsate blank will be prepared with distilled, deionized (DI) water to evaluate effectiveness of decontamination procedures for DPT sampling equipment. One soil trip blank will be prepared by the contracted laboratory to evaluate contamination introduced during transportation of containers/samples. The QC samples will be submitted for the analyses listed in the attached tables. Evaluation of blank samples depends on levels of contamination found in environmental samples to determine whether the environmental samples are representative. Analytical results from 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 determination of total method precision is not required for this project, no field duplicate samples will be collected.
- Other (Describe):

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

- Not Applicable
- In accordance with the **Generic QAPP for the Superfund Site Assessment and TBA Programs (October 2017)**.
- Other (Describe): Testing, inspection, and maintenance of field instruments (photoionization detector [PID], Global Positioning System [GPS] units) will comply with manufacturers' recommendations. Testing, inspection, and maintenance of analytical instrumentation will comply with the previously referenced SOPs and manufacturers' recommendations.

**2.7 Instrument Calibration and Frequency:**

- Not Applicable
- In accordance with the **Generic QAPP for the Superfund Site Assessment and TBA Programs (October 2017)**.
- 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) will accord with the manufacturers' recommendations.

**2.8 Inspection/Acceptance Requirements for Supplies and Consumables:**

- Not Applicable
- In accordance with the **Generic QAPP for the Superfund Site Assessment and TBA Programs (October 2017)**.
- 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 QAPP for the Superfund Site Assessment and TBA Programs (October 2017)**.
- Previous data/information pertaining to the site (including other analytical data, reports, photos, maps, etc., which are referenced in this QAPP) have 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, the information will not be used for decision-making purposes by EPA without verification by an independent professional qualified to verify such data/information.
- Other (Describe):

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**2.10 Data Management:**

- All laboratory data acquired will be managed in accordance with Region 7 EPA SOP 2410.01.
- Other (Describe): Site-specific data management procedures are addressed in Appendix C.
- Other (Describe): All laboratory data acquired at the START-contracted laboratory will be managed in accordance with its established procedures.

**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 associated with the START-contracted laboratory are addressed in its SOPs.

**3.1A Corrective Action:**

- Corrective actions will be taken at the discretion of the EPA Project Manager, whenever there appear to be problems that could adversely affect data quality and/or resulting decisions affecting future response actions pertaining to the site.
- 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 Tetra Tech START and submitted to the EPA.
- Reports will be prepared in accordance with the **Generic QAPP for the Superfund Site Assessment and TBA Programs (October 2017)**.
- 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 QAPP for the Superfund Site Assessment and TBA Programs (October 2017)**.
- 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 and 2430.12.
- Other (Describe): Data from the START-contracted laboratory will be validated by application of methods 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), at the frequency specified in that guidance document. A Stage 2B validation includes verification and validation based on a 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 and 2430.12.
- 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 that they are acceptable. The EPA Project Manager will also compare the sample descriptions with the field sheets for consistency and will ensure that any anomalies in the data are appropriately documented.
- Other (Describe): If any problems with field measurements or analytical data are identified by data verification/validation, the EPA Project Manager will be informed to explain circumstances of the problem, describe any corrective action taken, and provide an opinion on limitations and usefulness of the data

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**4.3 Reconciliation with User Requirements:**

- Identified in attached table:
- 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**

<b>Site Name:</b> Hiland Roberts Dairy St. Joseph				<b>Location:</b> St. Joseph, Missouri			
<b>START Project Manager:</b> Kirk Mammoliti				<b>Activity/ASR #:</b> Not applicable (NA)		<b>Date:</b> February 2018	
<b>No. of Samples</b>	<b>Matrix</b>	<b>Location</b>	<b>Purpose</b>	<b>Depth or Other Descriptor</b>	<b>Requested Analysis</b>	<b>Sampling Method</b>	<b>Analytical Method/SOP</b>
5	Groundwater	On-site Geoprobe® temporary wells	To determine whether groundwater contamination from site operations is present	Directly below groundwater table	Arsenic, barium, cadmium, chromium, lead, and selenium (dissolved)	SOPs 4230.07 & 4231.2007	Method 6020
8	Surface soil	On-site Geoprobe® soil borings	To determine whether surface soil contamination from site operations is present	0 to 3 feet below ground surface (bgs)	VOCs, oxygenates, TPH – GRO, TPH – DRO, TPH – ORO, PAHs, arsenic, barium, cadmium, chromium, lead, and selenium	SOPs 4230.07 & 4231.2012; Method 5035	Methods 8260B, 8260B-SIM, 8270C, and 6010
8	Subsurface soil	On-site Geoprobe® soil borings	To determine whether subsurface soil contamination from site operations is present	Photoionization detector (PID) screening, visual evidence of contamination, or odor (in absence of these, sample will be collected near groundwater table)	Arsenic, barium, cadmium, chromium, lead, and selenium	SOPs 4230.07 & 4231.2012; Method 5035	Methods 8260B, 8260B-SIM, 8270C, and 6010
<b>QC SAMPLES</b>							
<b>Blanks</b>							
1	Water	Equipment rinsate blank	To evaluate effectiveness of decontamination procedures for Geoprobe® sampling equipment	Not applicable (NA)	Arsenic, barium, cadmium, chromium, lead, and selenium (dissolved)	NA	Methods 6020
1	Water	Soil trip blank	To assess precision of analytical and sampling methods	NA	VOCs	NA	Method 8260B

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Table 2: Data Quality Objective Summary								
Site Name: Hiland Roberts Dairy St. Joseph				Location: St. Joseph, Missouri				
START Project Manager: Kirk Mammoliti				Activity/ASR #: Not applicable (NA)			Date: February 2018	
Analysis	Analytical Method	Data Quality Measurements					Sample Handling Procedures	Data Management Procedures
		Accuracy	Precision	Representativeness	Completeness	Comparability		
<b>Soil</b>								
VOCs, oxygenates, TPH – GRO, TPH – DRO, TPH – ORO, PAHs, arsenic, barium, cadmium, chromium, lead, and selenium	see Table 1	per analytical method	per analytical method	Biased/judgmental sampling based on professional judgement of the sampling team	100%; No specific critical samples have been identified	Standardized procedures for sample collection and analysis will be used	See Section 2.3 of QAPP	See Section 2.10 of QAPP form
<b>Groundwater</b>								
Arsenic, barium, cadmium, chromium, lead, and selenium (dissolved)	see Table 1	per analytical method	per analytical method	Biased/judgmental sampling based on professional judgement of the sampling team	100%; No specific critical samples have been identified	Standardized procedures for sample collection and analysis will be used	See Section 2.3 of QAPP	See Section 2.10 of QAPP form

**APPENDIX A**

**SITE-SPECIFIC INFORMATION REGARDING INVESTIGATIVE ACTIVITIES AT THE  
HILAND ROBERTS DAIRY ST. JOSEPH 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 under contract number EP-S7-13-06 to conduct a Phase II Targeted Brownfields Assessment (TBA) of the Hiland Roberts Dairy St. Joseph site in St. Joseph, Buchanan County, Missouri (the site), at 218, 221, and 302 South (S.) 5<sup>th</sup> Street (see Appendix B, Figures 1 and 2). The subject property has been historically used as an industrial dairy plant and is owned by Roberts Dairy Co. The parcel at 218 S. 5<sup>th</sup> Street includes a gravel parking lot with a small portion that is paved with concrete. The parcel at 221 S. 5<sup>th</sup> Street includes an asphalt paved parking lot and a structure. The parcel at 302 S. 5<sup>th</sup> Street includes a gravel parking lot with some portions paved, in addition to a single structure. The site is currently not in use.

The primary purpose of this investigation is to further characterize the site to determine if hazardous substances have been released to environmental media at the site. The scope of the TBA will include surface and subsurface soil and groundwater sampling based on recognized environmental conditions (REC) identified during two previous Phase I Environmental Site Assessments (ESA) (Environmental International Government Ltd. [EIGov] 2010a and Seagull Environmental Technologies, Inc. [Seagull] 2016) and contamination detected in soil and groundwater during two previous Phase II ESAs (EIGov 2010b and Terracon Consultants, Inc. [Terracon] 2017b).

This Phase II TBA will be consistent with ASTM E1903-11 for Phase II ESAs, and otherwise in compliance with EPA's "All Appropriate Inquiries" Rule (AAI Rule) (40 *Code of Federal Regulations* [CFR] Part 312). This Quality Assurance Project Plan (QAPP) identifies site-specific features and addresses elements of the sampling strategy and analytical methods proposed for the Phase II TBA.

## **SITE BACKGROUND INFORMATION**

Information regarding the site's location, description, background, and relevant investigation history is discussed in this section.

### **Site Location/Description**

The site is at 218, 221, and 302 S. 5<sup>th</sup> Street in St. Joseph, Missouri, in northwest Buchanan County (see Appendix B, Figures 1 and 2). The site is included on the Saint Joseph North and South, Missouri U.S. Geological Survey (USGS) 7.5 minute topographic series maps (USGS 1981a, b). Coordinates at the

approximate center of the site are 39.764962 degrees north latitude and 94.854137 degrees west longitude.

The site encompasses approximately 1 acre, and consists of three parcels (218, 221, and 302 S. 5<sup>th</sup> Street). The site includes one structure at 221 S. 5<sup>th</sup> Street and one structure at 302 S 5<sup>th</sup> Street, and is currently owned by Roberts Dairy Co. Historically, the site was used as an industrial dairy plant.

### **Geology and Hydrogeology**

The site is within the northwest portion of Missouri in Buchanan County. Predominant soils at the site include urban land and bottomland soils consisting of a 0-3 percent slope (U.S. Department of Agriculture [USDA] Natural Resources Conservation Service [NRCS] 2017). The site is approximately 0.3 mile east of the Missouri River.

According to the Phase I ESA by EIGov, geology in the region is typically characterized by unconsolidated alluvial deposits that overlie Pennsylvanian-aged bedrock of the Lansing Group, consisting primarily of limestone and shale (EIGov 2010a). Boring logs from Phase II ESAs conducted by EIGov and Terracon found primarily silty clay and clayey silt soils at depths up to 28 feet below ground surface (bgs). Groundwater was generally encountered between 12 to 17 feet bgs (EIGov 2010b, Terracon 2017b).

Groundwater flow is believed to be to the west-southwest toward the Missouri River.

### **Previous Investigations**

#### EIGov 2010 Phase I ESA

EIGov conducted a Phase I ESA of 302 S. 5<sup>th</sup> Street in April 2010. Significant findings are as follows (EIGov 2010a):

- Based on available Sanborn<sup>®</sup> maps, a coal yard and filling station were identified as previously present on the property. These former facilities and neighboring commercial and industrial facilities pose a REC to the subject property.
- An Environmental Data Resources (EDR) environmental database search occurred pertaining to the 302 S. 5<sup>th</sup> Street property. EDR identified numerous listed facilities within ASTM International (ASTM)-recommended search distances from the subject property. These included two leaking underground storage tank (LUST) sites, Hiland Dairy Division (221 S. 5<sup>th</sup> Street) and Central Fire Station (401 S. 7<sup>th</sup> St), both upgradient of 302 S. 5<sup>th</sup> Street. Although the Missouri Department of Natural Resources (MDNR) considers these sites closed, based on their proximity

to and location upgradient of the 302 S. 5<sup>th</sup> Street property, they pose historical RECs to the subject property.

#### EIGov 2010 Phase II ESA

EIGov conducted a Phase II ESA of 302 S. 5<sup>th</sup> Street following conclusion of the Phase I ESA in April 2010. The Phase II ESA involved collection of six soil samples and one groundwater sample. Results from sampling indicated benzo(a)pyrene in surface soil (near the center of the property) at concentration exceeding the Lowest Default Target Level (LDTL) of 0.62 milligrams per kilogram (mg/kg) (EIGov 2010b). In addition, this sample was the only soil sample to contain polycyclic aromatic hydrocarbons (PAH), and contained highest concentrations of arsenic and lead. Total petroleum hydrocarbons (TPH) – diesel-range organics (DRO) and TPH – oil-range organics (ORO) were also detected in the deep sample collected from this same borehole, but not at levels exceeding risk-based criteria. EIGov indicated that these detections were likely the result of one or more localized historical fuel spills.

Acetone was detected in all six soil samples, and benzene was detected in all but one soil sample; however, concentrations were below risk-based criteria. Arsenic and lead were detected at concentrations above risk-based criteria in all soil samples. Other metals were also detected in soil, but not at levels exceeding LDTLs, including barium, cadmium, chromium, and mercury. EIGov concluded that because the 302 S. 5<sup>th</sup> Street property had been used as a parking and loading area since 1965, lead detected in shallow soil was likely the result of localized fuel spills that have since degraded, thus leaving behind heavy metals.

Groundwater results indicated no contaminants at levels exceeding LDTLs. EIGov recommended further sampling to determine if more significant contamination exists, to assess possible migration pathways, and to eliminate additional source areas.

#### Seagull 2016 Phase I ESA

Seagull conducted a Phase I ESA of the Hiland Dairy Foods/Roberts Dairy site in October 2016. The Phase I ESA included 218, 221, and 302 S. 5<sup>th</sup> Street. Seagull found the following significant findings (Seagull 2016):

- The 221 S. 5<sup>th</sup> Street property is listed in the LUST, Underground Storage Tank (UST), and SPILLS databases. These databases note removals of USTs at the site in 1996 by Putnam Petroleum Services: two 4,000-gallon gasoline USTs, one 2,000-gallon gasoline UST, one 1,000-gallon waste oil UST, and one 500-gallon waste oil UST. A No Further Action (NFA) letter was issued for the site. However, because the NFA letter did not indicate whether soil or

groundwater sampling had occurred, former presence of these USTs poses a REC to the subject properties.

- One US Hist Cleaners is listed—Rusty’s Downtown Laundry (301 S. 5<sup>th</sup> Street), adjacent to the subject properties. The site thus poses a REC to the subject properties.
- During initial vapor encroachment screening of the site, potential vapor encroachment conditions (pVECs) were identified due to historical uses of the subject and adjacent properties. Therefore, these pVECs pose RECs to the subject properties.
- The 302 S. 5th Street property was identified as a coal yard on the 1911 Sanborn® map. The coal yard poses a REC to the subject properties.
- The 302 S. 5th Street property was identified as a filling station with one tank on the 1949 Sanborn map. The filling station and tank pose a REC to the subject properties.
- The 221 S. 5th Street property was identified as an auto repair facility, and the 302 S. 5th Street property as an automobile parking lot on the 1955 Sanborn map. The auto repair facility poses a REC to the subject properties.
- The 302 S. 5th Street property was identified as an automobile parking lot and oil storage area on the 1965 Sanborn map. The oil storage area poses a REC to the subject properties.
- A chemical company, TKO Chemical Company, was identified at 303 S. 5th Street in the 1970, 1975, and 1980 city directories. Based on proximity and groundwater flow, the site poses a REC to the subject properties.
- A laundry, Rusty’s Downtown Laundry, was identified at 301 S. 5th Street in the 1999 city directory. Based on proximity and groundwater flow, the site poses a REC to the subject properties.
- It was determined that asbestos-containing material (ACM) and lead-based paint (LBP) may be present at or within the office/garage at the 221 S. 5th Street property. In addition, electrical ballasts possibly containing polychlorinated biphenyls (PCB) were identified in the garage.

#### Terracon 2017 Asbestos and LBP Survey

Terracon conducted an Asbestos and LBP Survey at 218, 221, and 302 S 5<sup>th</sup> Street in October 2017 (Terracon 2017a). Terracon identified ACM in tar roofing (2,016 square feet) and transite cement asbestos flue pipe (9 linear feet) at the structure located at 221 S. 5<sup>th</sup> Street. LBP was identified at 221 S. 5<sup>th</sup> Street on a garage restroom wood door, including jamb and casing; on a garage wood door opening jamb and casing; and on a garage overhead door wood frame and metal lintel. LBP was identified at 302 S. 5<sup>th</sup> Street at the base of a raised concrete slab stair metal handrail.

## Terracon 2017 Phase II ESA

Terracon conducted a Phase II ESA at the 218, 221, and 302 S. 5<sup>th</sup> Street properties in October 2017 (Terracon 2017b). Field activities included collection of seven surface soil and seven subsurface soil samples (three borings at 221 S. 5<sup>th</sup> Street and four borings at 302 S. 5<sup>th</sup> Street). Results indicated presence of volatile organic compounds (VOC) and TPH at concentrations below Default Target Levels (DTL) in both surface and subsurface soils. The following metals were also detected at concentrations below DTLs in surface and subsurface soils: barium, cadmium, chromium, mercury, selenium, and silver. Arsenic and lead were detected at concentrations in surface and subsurface soils above DTLs and/or residential Missouri Risk-based Corrective Action (MRBCA) Tier 1 Risk Based Target Levels (RBTL), but below non-residential RBTLs.

Terracon also collected seven groundwater samples during the Phase II ESA. Concentrations of VOCs, TPHs, arsenic, cadmium, mercury, selenium, and silver were below laboratory detection limits. Barium and chromium were detected, but at concentrations below MRBCA DTLs. Dissolved lead was detected in one groundwater sample at 0.0425 milligrams per liter (mg/L), above the DTL of 0.015 mg/L. Dissolved lead concentrations in the remaining groundwater samples were below laboratory detection limits.

## MDNR 2017 Findings

On October 10, 2017, MDNR issued a letter regarding findings of the Phase II ESA by Terracon. The letter indicated that Brownfield/Voluntary Cleanup Section (BVCP) had reviewed the Phase II ESA report and agreed with Terracon's conclusions. BVCP recommended the following (MDNR 2017):

- Further characterization of the site to determine if hazardous substances had been released to soil and groundwater
- If Mo-Kan Regional Council wants to proceed with a Phase II ESA, that U.S. Environmental Protection Agency (EPA) should conduct this.

This QAPP envisions a Phase II ESA based on the recommendations of MDNR.

## **SAMPLING STRATEGY AND METHODOLOGY**

In support of EPA Region 7, under this task order, Tetra Tech START will conduct soil and groundwater sampling to assess impact(s) from historical operations at the site. Sampling activities are tentatively scheduled for March or April 2018, and are expected to require one to two people and take up 2 days. When applicable, standard operating procedures (SOP) and chain-of-custody (COC) procedures

referenced in this QAPP will be followed throughout sampling activities to verify integrity of samples from time of collection until submittal for laboratory analysis. Disposal of investigation-derived wastes (IDW) and procedures for equipment and personal decontamination will be addressed in a site-specific health and safety plan prepared by Tetra Tech. Most IDW is expected to consist of disposable sampling supplies (gloves, paper towels, etc.) that will be disposed of off site as uncontaminated solid waste. Assuming association of site-related contamination with the site's historical use as a gasoline filling station and automotive garage (including storage of waste oil), analysis of soil and groundwater samples will proceed as recommended in Table 5-1 from the MDNR MRBCA Process for Petroleum Storage Tanks Guidance Document (updated October 2013). However, groundwater samples collected will only be analyzed for dissolved metals listed in the MDRN MRBCA Process for Petroleum Storage Tanks Guidance Document, as previous investigations have not yielded concentrations of any contaminants of concern provided in this guidance. Table A-1 below summarizes analyses recommended by this guidance. Descriptions of the sampling strategy and procedures follow. Tentative sample locations are shown on Figure 3 in Appendix B.

**TABLE A-1**  
**ANALYSES OF SOIL SAMPLES**

<b>Analyte</b>	<b>Analytical Method</b>
<b>Volatiles</b>	
Benzene	8260B
Toluene	8260B
Ethylbenzene	8260B
Xylenes (total)	8260B
1,2-Dibromoethane/Ethylene dibromide (EDB)	8260B/8260B-SIM
1,2-Dichloroethane/Ethylene dichloride (EDC)	8260B/8260B-SIM
<b>Oxygenates</b>	
Methyl tertiary butyl ether (MTBE)	8260B
Tertiary amyl methyl ether (TAME)	8260B
Tertiary butyl alcohol (TBA)	8260B
Ethyl tertiary butyl ether (ETBE)	8260B
Diisopropyl ether (DIPE)	8260B
Ethanol	NA
Methanol	NA
<b>TPHs</b>	
TPH-GRO	8260B
TPH-DRO	8270C
TPH-ORO	8270C
<b>PAHs</b>	
Acenaphthene	8270C
Anthracene	8270C
Benzo(a)anthracene	8270C
Benzo(a)pyrene	8270C
Benzo(b)fluoranthene	8270C

**TABLE A-1 (Continued)**  
**ANALYSES OF SOIL SAMPLES**

<b>Analyte</b>	<b>Analytical Method</b>
Benzo(k)fluoranthene	8270C
Chrysene	8270C
Dibenzo(a,h)anthracene	8270C
Fluoranthene	8270C
Fluorene	8270C
Naphthalene	8260B, 8270C
Pyrene	8270C
<b>Metals</b>	
Arsenic	6010B, 6020
Barium	6010B, 6020
Cadmium	6010B, 6020
Chromium	6010B, 6020
Lead	6010B, 6020
Selenium	6010B, 6020

Notes:

Analytes and analytical methods follow Table 5-1 of MRBCA Guidance Document (October 2013).

- DRO Diesel-range organics
- GRO Gasoline-range organics
- ORO Oil-range organics
- PAH Polycyclic aromatic hydrocarbon
- TPH Total petroleum hydrocarbons

**Soil Sampling**

Tetra Tech START proposes to advance as many as eight soil borings to collect soil samples within the site. At each boring location, START will advance a direct-push technology (DPT) rig containing disposable polyvinyl chloride (PVC) liners to a maximum depth of 25 feet bgs, to geologic refusal, or to the groundwater table, whichever comes first.

As many as two soil samples will be collected from each boring (total of 14 soil samples) and submitted for laboratory analysis. Soil cores will be screened by use of a hand-held photoionization detector (PID) for presence of elevated concentrations of VOCs. One surface soil sample will be collected within 0 to 3 feet bgs. A second sample will be collected within the depth interval inducing the highest PID reading. If no elevated readings are observed, collection will occur within intervals where visual impacts appear or odors are detected. If no indications of contamination are found, the soil samples will be collected within depth intervals selected by EPA or the START field team that could include the capillary fringe (if groundwater is encountered) and bottom of boring.

Within each sample interval, a grab sample for analyses for VOCs, TPH-GRO, and oxygenates will be collected in accordance with EPA SW-846 Method 5035; it will consist of two 40-milliliter (mL) vials, each preserved with sodium bisulfate and containing approximately 5 grams of soil—one also including

methanol. In addition, one unpreserved 40 mL vial will be packed with soil for percent solids determination. Remaining soil from each sample interval will be placed in a disposable aluminum pie pan by use of a disposable stainless steel spoon, homogenized, and placed into sample containers for analyses for TPH-DRO, TPH-ORO, PAHs, and metals.

### **Groundwater Sampling**

Tetra Tech proposes to advance DPT temporary wells for groundwater sampling at as many as five locations. Each DPT well will be collocated with a DPT soil boring (see Appendix B, Figure 3). START will collect groundwater samples near the water table at each DPT temporary well. Expected depth to groundwater is between 15 and 25 ft bgs. If groundwater is not encountered within 30 feet of the surface, no groundwater sample will be collected.

Samples from temporary wells will be collected by use of a Geoprobe® Screen Point 16 sampling apparatus containing either disposable 4-foot-long, PVC screens or a Geoprobe reusable stainless steel screen. At each location, the sampler will be advanced to approximately 4-5 feet below the water table, and then the screen will be exposed to the aquifer. After the screen is deployed at the bottom of the boring, about 1 gallon of water will be purged through disposable polyethylene tubing utilizing a check valve placed at the bottom of the tubing.

Samples will be collected into 500-milliliter (mL), high-density polyethylene (HDPE) plastic bottles preserved with nitric acid (HNO<sub>3</sub>) for dissolved arsenic, barium, cadmium, chromium, lead, and selenium analysis. The samples will be filtered in the field with a disposable 0.45-micron filter prior to placement in the preserved sample container.

After sampling at each location, the groundwater sampler and rods will be decontaminated with a tap water and Alconox wash, followed by a tap water rinse, before sampling occurs at the next location. New tubing will also be used at each well location.

Following collection of each sample, its location (i.e., depth and global positioning system [GPS] coordinates) will be recorded in the site logbook in accordance with EPA SOP 2341.01. Each sample will be labeled and packaged accordingly, and placed in a cooler maintained at or below a temperature of 4 degrees Celsius (°C) from time of collection until submittal to a START-contracted laboratory for analysis. After completion of sampling, all DPT boreholes will be plugged with bentonite from bottom of bore hole to ground surface. Any disturbance to surface materials (concrete or asphalt) will be patched with appropriate material.

## **QUALITY CONTROL (QC) SAMPLES**

To evaluate QC, one equipment rinsate blank (water) and one soil trip blank will be collected, as specified in Section 2.5 of the original QAPP. The blank samples will be submitted for analysis for VOCs.

To assess decontamination procedures applied to Geoprobe groundwater sampling equipment, an equipment rinsate sample will be collected during field activities (at time and location determined by the START Project Manager), following decontamination of the Geoprobe Screen Point 16 groundwater sampler. Decontamination of Geoprobe samplers and rods will involve a tap water and Alconox wash and tap water rinse. Following decontamination, the equipment rinsate sample will be collected as follows: personnel will pour deionized water, supplied by the START-subcontracted analytical laboratory, through the groundwater sampling apparatus and into the appropriate sample containers.

The soil trip blank sample, prepared by the START-subcontracted analytical laboratory, will accompany and be submitted with the corresponding samples. Trip blank sample results will indicate whether any cross-contamination of samples will have occurred during sample shipment.

A summary of all anticipated samples for this project is in Table 1. A summary of data quality objectives for this project is in Table 2. SOPs and COC procedures referenced in the original QAPP and this QAPP Addendum will be followed throughout sampling activities to verify integrity of samples from time of collection until submittal to the laboratory for analysis.

## **ANALYTICAL METHODS**

Soil samples will be analyzed at a START-contracted laboratory for VOCs, oxygenates, TPHs, PAHs, and metals as recommended in the MRBCA Guidance Document and listed in Table A-1 above.

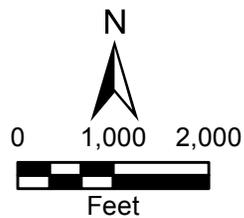
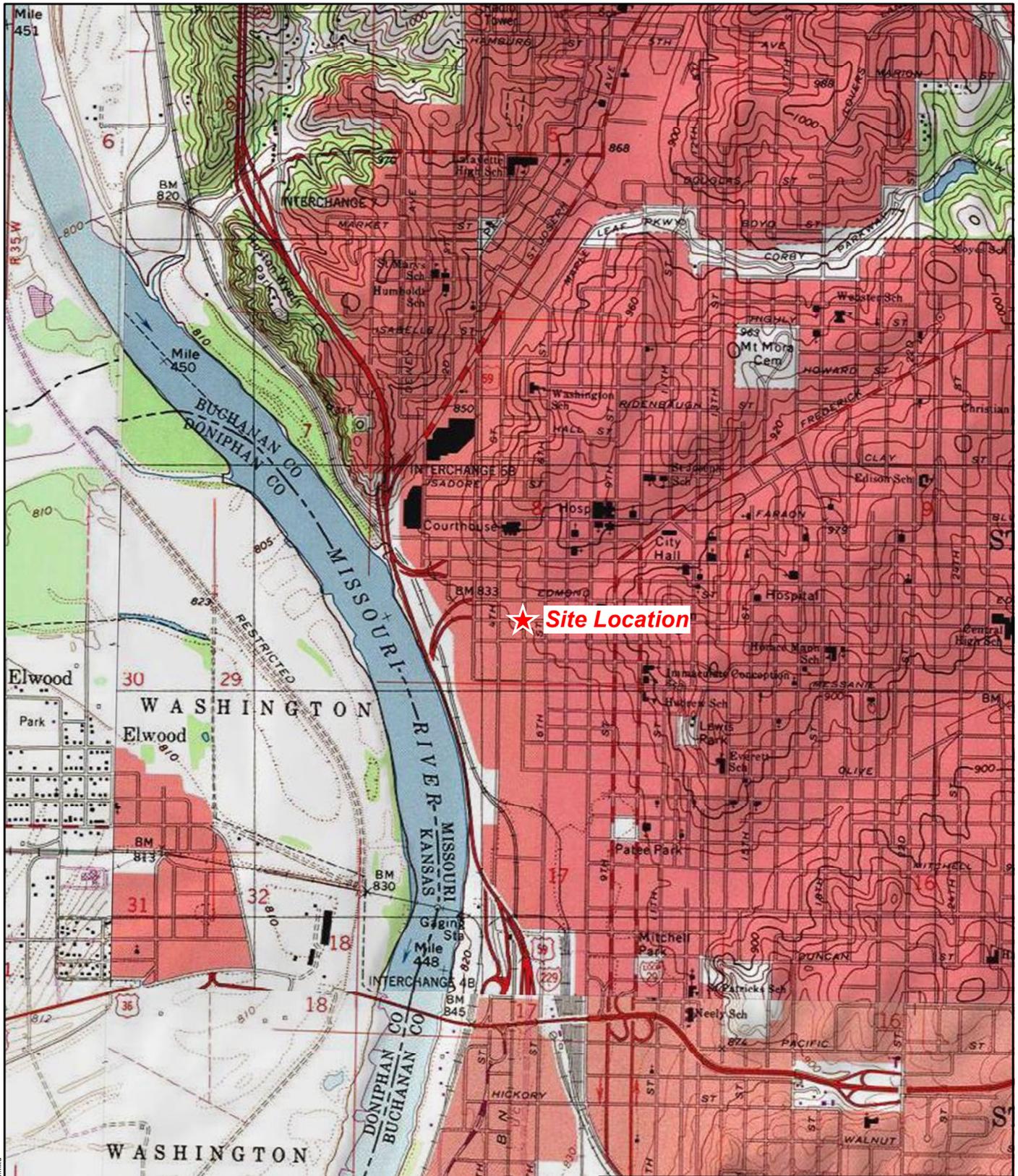
Groundwater samples will be analyzed at a START-contracted laboratory for only dissolved metals as recommended in the MRBCA Guidance Document and listed in Table A-1 above. START will ensure that the START-contracted laboratory can implement project-required analytical methods appropriate for the contaminants of concern at the levels required. Standard turnaround times and detection limits for those methods will be adequate for this project. Appropriate containers and physical/chemical preservation techniques will be applied during field activities to help verify acquisition of representative analytical results. Submittal of samples to the laboratory is expected in late March or early April 2018. Specified analytical methods are expected to achieve levels of detection that will enable EPA decision-makers to determine if response is warranted to address site-related contamination presenting a threat to human health or the environment. Results will be compared to MRBCA DTLs and Tier I standards for industrial land use.

## REFERENCES

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- Seagull Environmental Technologies, Inc. (Seagull). 2016. Phase I Environmental Site Assessment, Hiland Dairy Foods/Roberts Dairy Site, St. Joseph, Missouri. October.
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## **APPENDIX B**

### **FIGURES**



Hiland Roberts Dairy St. Joseph  
 St. Joseph, Buchanan County, Missouri

**Figure 1**  
 Site Location Map



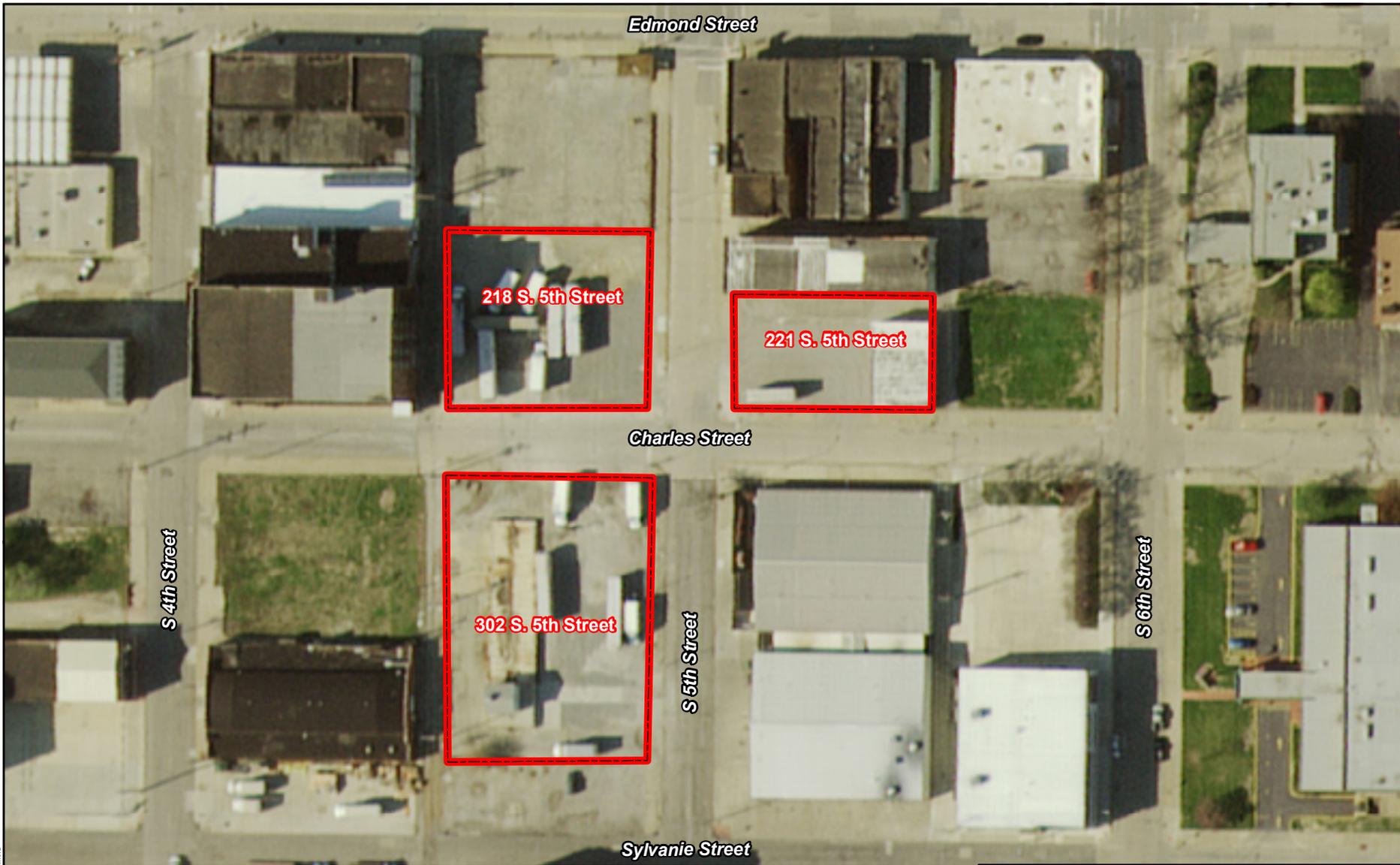
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 USGS Saint Joseph North, MO 7.5 Minute Topo Quad, 1981;  
 USGS Saint Joseph South, MO 7.5 Minute Topo Quad, 1981;  
 USGS Wathena, MO 7.5 Minute Topo Quad, 1981.

Date: 2/5/2018

Drawn By: Nick Wiederholt

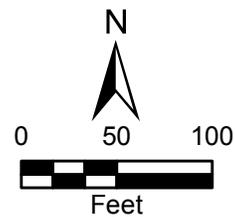
Project No: X9025.14.0002.049

C:\GIS\workspace\XG\9025.14.0002.049\Project\map\Figure1.mxd



Legend

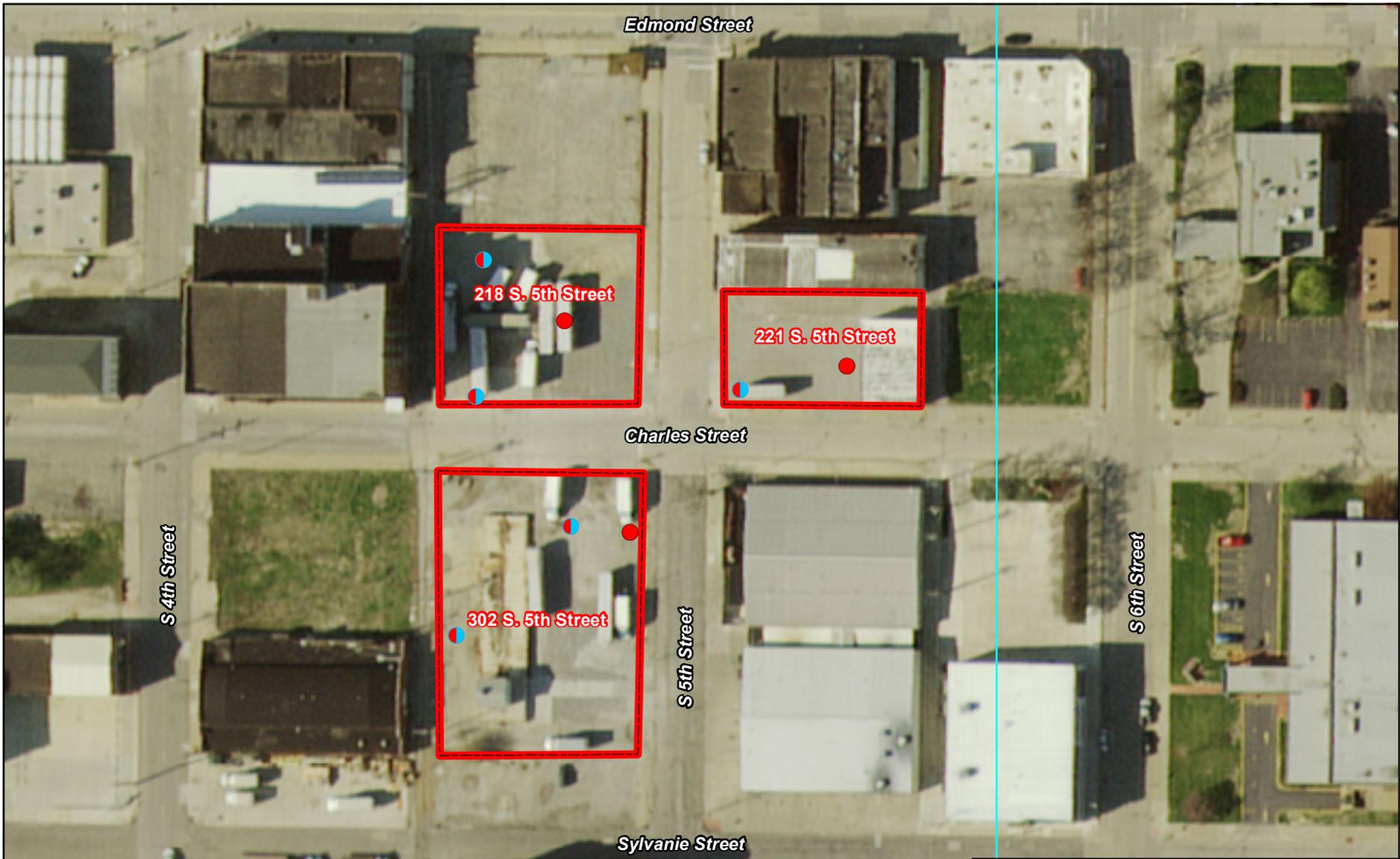
 Approximate property boundary



Hiland Roberts Dairy St. Joseph  
St. Joseph, Buchanan County, Missouri

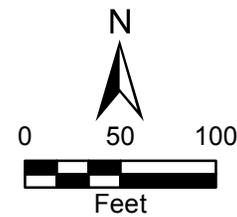
**Figure 2**  
Site Layout Map





**Legend**

- Proposed soil sample location
- ● Proposed soil/groundwater sample location
- Approximate property boundary



Hiland Roberts Dairy St. Joseph  
St. Joseph, Buchanan County, Missouri

**Figure 3**  
Proposed Sample Location Map



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**APPENDIX C**

**SITE-SPECIFIC DATA MANAGEMENT PLAN**

	<p>This SSDMP is intended to ensure data integrity and consistency by providing guidance for data collection by field personnel and subsequent data management activities. This document is intended to be used in conjunction with the Regional Data Management Plan (RDMP) and includes the details specific to this site or incident.</p>	<b>Site-Specific Data Management Plan (SSDMP)</b>			
		<b>Site Name:</b>	Hiland Roberts Dairy St. Joseph	<b>Site ID:</b>	NA
		<b>OSC:</b>	Todd Davis	<b>Date Initiated:</b>	2/9/2018
		<b>Data Manager:</b>	Nick Wiederholt (START)	<b>Last Updated:</b>	NA

## SECTION 1: TASKING

The following documents the data streams and data management tasks that will be supported at the site (X all that apply).

### Documents and Images

X	Data Stream	Repository	Reporting Requirements
X	Site Documents	EPAOSC.net	Upload electronic files and metadata to repository and generate a log of files in the repository.
X	Site Photos		
X	Log Books		
	Field Sheets		

### Analytical

X	Data Stream	Repository	Reporting Requirements
X	Sampling Data	Scribe	Publish data to repository and generate data summary tables and figures for Final Report.
X	Lab Results		
X	Validation Qualifiers		

### Monitoring

X	Data Stream	Repository	Reporting Requirements
	Field Monitoring	Scribe.net	Publish data to repository and generate data summary tables and figures for Final Report.
	RAT / FAST System	Scribe.net	
	Viper Monitoring	Viper.net	
	Reconnaissance	ERT Cloud	

### Other

X	Task	Documents/Images	Analytical	Monitoring
	Use the following data streams to deploy a site-specific spatial data viewer:			
	Manage the following data streams collected by other agencies, contractors, or potentially responsible persons (PRP):			
X	Field data collection	X	X	

**SECTION 2: DATA MANAGEMENT PRACTICES**

The following table outlines specific requirements for various data types involved during the project.

Data Stream <sup>1</sup>	Data Source <sup>2</sup>	Site-Specific Procedure (Y/N) <sup>3</sup>				
		Collection	Processing	Storage	Verification	Reporting
Site Documents	EPA, Missouri Department of Natural Resources	N	N	N	N	N
Site Photos	START camera	N	N	N	N	N
Log Books	Scanned pages of field notes	N	N	N	N	N
Sampling Data	Contained within Log Books	N	N	N	N	N
Lab Results	Electronic Data Deliverable from START-contracted laboratory	N	N	N	N	N
Validation Qualifiers	Data validation by START chemist	N	N	N	N	N
Field Data Collection	Collector Application on START iPad	N	N	N	N	N

1: Category of data to be managed at the site. Must match data stream(s) selected in Section 1. Create one line per category AND source.

2: List equipment or data file that serves as the source of the data (i.e., TVA 1000, camera, iPad, Trimble Global Positioning System [GPS], lab EDD). If secondary data, include the organization providing the data.

3: Y – indicates a site-specific procedure is employed, and an Appendix and/or Section 3 has been included to document the details; N – indicates data management follows procedures outlined in the RDMP.

**SECTION 3: SITE-SPECIFIC DATA ELEMENTS**

The following table documents deviations from the data standards identified in the RDMP.

Data Element	Required	Description	Format	Repository Table.Field	Valid Values