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SECTION 1.0  PROPOSAL PROCESS INFORMATION

1.1 PURPOSE

On behalf of the Owner/Operator (O/O), the Kansas Department of Health and Environment (KDHE) is soliciting bids from qualified Vendors to implement a pre-approved site assessment plan. The plan is designed to determine the extent of contamination and provide information for later development of the appropriate corrective action for contamination detected at the site.

1.2 OBJECTIVE

1.2.1 To provide information necessary for the preparation of competitive proposals by qualified Vendors.

1.2.2 To provide for a fair and objective evaluation of proposals.

1.2.3 To result in a contract between the O/O and the Vendor to provide the services as described in Sections 3.0 and 4.0 of this Request for Proposal (RFP).

1.3 LABOR DEFINITIONS

Professional 5: Associate Level (contract management, associate level review of projects)
Professional 4: Senior Level (senior project management, project geologist)
Professional 3: Design Level (design engineer)
Professional 2: Project Level (project manager)
Professional 1: Staff Level (staff engineer, field geologist, environmental scientist, health and safety supervisor)
Technical 4: Senior Technician (construction foreman, sr. environmental technician)
Technical 3: Technician (environmental technician, remediation technician, sampling technician)
Technical 2: Drafting/CAD (draftsman)
Technical 1: Clerical

Labor rates shall be inclusive of all overhead charges, administrative costs and profit. For staff performing field activities, labor rates shall further include Level D PPE. Rates will be listed for actual staff employed by the Vendor at the time of the bid submission.

A statement of qualification shall be provided for each staff member associated with a particular classification(s). Licensed Professionals must meet the State of Kansas Board of Technical Professions requirements. All other professionals, at a minimum, shall have a bachelor’s degree in an environmental field of study to be considered a “Professional.” The official station location must also be defined for each staff member.

KDHE shall reimburse for the scope of work performed, not by the Vendor’s staff title. For example, the same staff member may perform Project Geologist work to coordinate all project activities, perform site supervision as a Field Geologist and collect groundwater samples as an Environmental Technician. This staff member would bill hours at three different labor rates as defined above. Another example would be a licensed Engineer who bills at Design Engineer rates for remedial system design and as a Staff Engineer while performing routine field activities.
DEFINITIONS

1.4.1 “Corrective Action” means all action necessary to contain, collect, control, identify, analyze, clean up, treat, disperse, remove, or dispose of soils and groundwater contaminated by a release of petroleum products from a storage tank.

1.4.2 “Field Geologist” is the designated site representative for the Vendor. This position works under the direct supervision of the Vendor’s designated “Project Geologist”. Minimum qualifications for this position are: 1) has a Bachelor’s degree in Geology from an accredited four year college or a related degree with a minimum of 30 semester hours of geologic course work; 2) has overseen drilling activities and has described and recorded the subsurface lithology during the drilling of at least 21 boreholes; and 3) if performing groundwater sampling must meet the minimum qualifications for Sampling Technician (refer to 1.4.8).

1.4.3 “Landscape Professional” means an individual or company that engages in landscaping activities as a primary or substantial source of revenue. A Landscape Professional must possess a tax ID number and liability insurance under the company name. The landscape professional cannot be an employee of the general contractor.

1.4.4 “Petroleum” meaning a group of liquid hydrocarbons, including crude oil or any fraction thereof, which is liquid at standard conditions of temperature and pressure, including but not limited to, gasoline, diesel fuel, fuel oils and kerosene.

1.4.5 “Project Geologist” is the designated site representative for the Vendor, or the designated supervisor of the Vendor’s “Field Geologist(s)”. Minimum qualifications for this position are: 1) all the minimum qualifications for a “Field Geologist”; 2) currently a Licensed Geologist in the state of Kansas. This position is responsible for the preparation and certification of all geological information in reports and on maps; and 3) if performing groundwater sampling must meet the minimum qualifications for Sampling Technician (refer to 1.4.8).

1.4.6 “Project Manager” means the KDHE staff designated to be the lead technical interface with the Vendor.

1.4.7 “Project Manager” (Vendor) must meet the qualifications of, Project Geologist (1.4.5), or Environmental Scientist (1.4.9).

1.4.8 “Sampling Technician” The minimum qualifications for this position are: 1) has knowledge of EPA/KDHE sampling protocol and 2) has performed groundwater laboratory sampling of at least 30 monitoring wells.

1.4.9 “Environmental Scientist” The minimum qualifications for this position are: 1) Bachelor’s degree in Geology from an accredited four year college or a related degree with a minimum of 30 hours of geologic, hydrogeologic or environmental science course work and 2) if performing groundwater sampling must meet the minimum qualifications for Sampling Technician (refer to 1.4.8).

1.4.10 “Vendor” means any person (individual, partnership, association or corporation) who is seeking or is chosen to enter into a procurement contract with the O/O.
1.5  INQUIRIES

1.5.1 All inquiries concerning this RFP must be submitted in writing via email to the Lust/Investigation Unit Chief or KDHE Project Manager or mail to:

Petroleum Storage Tank Release Trust Fund
1000 SW Jackson, Suite 410
Topeka, KS 66612-1367
Attn: Investigation/LUST Unit Chief

1.5.2 Answers to all written questions will be distributed to all participating prospective Vendors by mail.

1.5.3 In all cases, no verbal communication will override written communications and only written communications are binding.

1.6  REVISIONS TO THE REQUEST FOR PROPOSAL

In the event it becomes necessary to revise any part of this RFP, revisions will be provided in writing to all Vendors who received this RFP.

1.7  SUBCONTRACTORS

If the Vendor intends to subcontract any part of the work to be performed under this RFP, the Vendor must include in its proposal a complete list of potential subcontractors and a description of the work to be subcontracted. The Vendor is responsible for assuring the subcontractors possess all licenses as required by the State of Kansas for the services they will provide.

1.8  SUBMISSION OF PROPOSAL

Proposals must be received by the Petroleum Storage Tank Release Trust Fund no later than 5:00 p.m. on the date specified on the Bid Proposal Cover Sheet and the Project Bid Proposal Sheet. Proposals must be e-mailed to kdhe.STSbidlist@ks.gov.

The proposal must include costs for all tasks necessary to complete the specified scope of work in accordance with all requirements outlined in the RFP.

1.8.1 Each bid must be sent in a separate e-mail with the Vendor’s Name and the Bid Number displayed in the Subject line. Failure to properly label the Subject line may result in the bid not being considered for review.

1.8.2 Late proposals will be disqualified. An e-mail will be sent notifying the Vendor that the proposal was received after the deadline.

1.8.3 KDHE and/or the O/O will not pay for any information herein requested, nor are they liable for any costs incurred by the Vendor to prepare or submit a proposal.
1.8.4 Proposals must include the following completed documents attached in the order listed below:

1) Exhibit 2 Project Bid Summary Sheet (multiple site bids only).
2) Bid Proposal Cover Sheet with Vendor Information.
3) Exhibit 2 Project Bid Proposal Sheet. The Vendor’s name must be entered in the upper right corner in the designated location. Proposals not submitted on the original form will be disqualified.
4) List of potential subcontractors not included on the Exhibit 2 Project Bid Proposal Sheet and a description of the work to be subcontracted.

1.8.5 Proposals that are not properly submitted and/or are not complete will be disqualified.

1.9 WITHDRAWAL OF BIDS

A Vendor may withdraw a bid at any time prior to the scheduled closing time for receipt of proposals.

1.10 PROPOSAL OBLIGATIONS

The contents of the proposal and any clarification thereto submitted by the successful Vendor shall become part of the contractual obligation and will be incorporated by reference into the ensuing contract.

1.11 TERM OF PROPOSAL

All proposals shall be firm for a period of ninety (90) days after the proposal due date to allow time for evaluation of all proposals and to make an award.

1.12 DISPOSITION OF PROPOSALS

All proposals become the property of the State of Kansas upon receipt and will not be returned to the Vendor. The State of Kansas shall have the right to use all ideas or adaptations of ideas contained in any proposal received in response to this RFP. Selection or rejection of the proposal will not affect this right.

1.13 NOTIFICATION OF APPROVED COSTS

After evaluation of the proposals, all Vendors who submitted proposals will be notified in writing of the approved costs for the Project.


1.15 CONFLICT OR AMBIGUITIES - Please refer to the Kansas Petroleum Storage Tank Release Trust Fund Policy and Procedure Manual.
SECTION 2.0 CONTRACT INFORMATION

2.1 PURPOSE

This section will outline the type of contract contemplated and will set forth contract clauses that need to be contained in any resultant contract.

2.2 CONTRACT DOCUMENT

2.2.1 The Contract between the O/O and the Vendor shall consist of, at a minimum, the following: 1) This RFP and any amendments thereto, 2) the Vendor’s proposal submitted in response to the RFP, and 3) the Owner/Operator Standard Contract (see Attachment E) or equivalent.

2.2.2 For the purpose of contract uniformity, the Owner/Operator Standard Contract (Attachment E) in this RFP should be used.

2.2.3 In the event of any inconsistency or contradiction between this RFP and the Vendor’s proposal and/or contract form, the provisions of this RFP are controlling.

2.2.4 The O/O and the Vendor are to enter into the contract within 14 days following the approval of the costs. A copy of the Owner/Operator Standard Contract or equivalent must be forwarded to KDHE as soon as it is signed by both parties.

2.3 RESPONSIBILITIES

2.3.1 The O/O is responsible for assuring the investigation and/or corrective action is conducted in accordance with the KDHE specification described in Sections 3.0, 4.0 and 5.0.

2.3.2 The O/O and the Vendor selected to perform this scope of work are responsible for maintaining the initial project costs approved by KDHE. Any change to the value of this contract will be in accordance with the Vendor’s proposed unit pricing and must be approved in writing by KDHE prior to the Vendor commencing work. KDHE reserves the right to deny any changes.

2.3.3 The O/O and the Vendor are responsible for securing and complying with any and all federal, State of Kansas or local permits and regulations regarding the Scope of Work defined in this RFP.

2.3.4 The Vendor must inform KDHE if they are made aware of a change in Trust Fund applicant contact information.

2.4 ERRORS IN PREPARATION

The Vendor is responsible for any mathematical error or incorrect extension of any calculations in the Vendor’s price quotes. In case of discrepancies, the Vendor unit cost will be multiplied by the units provided and the resultant unit price will be used in the evaluation. Any proposal with an error will be disqualified if there is a five percent or less difference between it and the next lowest qualified proposal. If the percent difference is greater than five percent, the corrected amount will be considered the Vendor’s submission and subject to approval.
2.5 CONTRACT AMENDMENTS

Modification, amendment, or any extension to a contract resulting from this RFP must be in writing. The O/O must receive prior written approval from KDHE for the changes. KDHE reserves the right to deny any modifications, amendments, or extensions.

2.6 COMPLIANCE WITH LAW

The Vendor agrees to comply with all applicable federal, state, and local laws, rules, regulations and ordinances; all provisions required thereby to be included herein are hereby incorporated by reference. The Vendor agrees to indemnify and hold the O/O and KDHE harmless from any loss, damage, or liability resulting from the violation on the part of the Vendor of such laws, rules, regulations, or ordinances.

2.7 SEVERABILITY

The invalidity in whole or part of any provision of the contract shall not void or affect the validity of any other provision.

2.8 ASSIGNMENT, TRANSFER, CONVEYANCE, SUBCONTRACT, AND DISPOSAL

The Vendor shall not assign, transfer, convey, subcontract, or dispose of any contract resulting from this RFP, or its rights, title, interest, or power to execute such assignments to any other person, company, corporation, or entity without the written consent of the O/O and KDHE.

2.9 INSURANCE

The Vendor shall maintain, at its expense during the term of the contract, the following insurance covering the services to be performed under this contract:

2.9.1 Workmen’s compensation-statutory.

2.9.2 Employers liability insurance in the minimum amount of $500,000.00 per occurrence with a $1,000,000.00 aggregate.

2.9.3 Comprehensive general liability insurance of $1,000,000.00 per occurrence with a $1,000,000.00 aggregate.

2.9.4 Vehicle liability (property damage and bodily injury combined) of $500,000.00 per occurrence.

2.9.5 Professional liability insurance of $1,000,000 per occurrence with a $1,000,000 aggregate.

2.9.6 The successful Vendor will provide the O/O, within twenty (20) working days of the contract signing, a certificate of insurance (ACORD Form 25) naming the O/O as the certificate holder. In the Description section of the ACORD Form, the KDHE project code and KDHE project name must be referenced. The cancellation clause of the ACORD Form will read as follows:
“Should any of the above described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.”

A copy of this document must be provided to the KDHE project manager within the same 20 working day time period.

2.10 INDEMNIFICATION

Neither the O/O nor KDHE shall be liable for any damage or compensation payable at law in respect to or in consequence of any accident or injury to any worker or other person in the employment of the Vendor or any subcontractor, save and except an accident or injury resulting from a willful negligent act or default of the O/O or KDHE.

The Vendor shall indemnify and keep indemnified the O/O and KDHE against all such damages and compensation, save and except as aforesaid, and against all claims, proceedings, costs, charges, and expenses whatsoever in respect thereof or in relation thereto.

2.11 LIEN RELEASES

A release of liens must be provided to the O/O and included in the Final Report.

2.12 COMMUNICATION AND NOTICES

Any written notice to the Vendor shall be deemed sufficient when deposited in the United States mail, postage prepaid, and addressed to the Vendor at its address listed on the signature page of the contract or at such address as the Vendor may have requested in writing or which is hand carried and presented to an authorized employee of the Vendor at its address as listed on the signature page of the contract.

2.13 TERMINATION

2.13.1 Termination for cause

The O/O or the Vendor may terminate the contract resulting from this RFP at any time when either Party fails to carry out its obligations under the provisions of this RFP or to make substantial progress under the terms specified in the RFP and the resulting proposal and contract.

2.13.2 The O/O shall provide the Vendor with written notice of conditions adversely affecting performance. If after such notice the Vendor fails to remedy the conditions contained in the notice within ten (10) working days, the O/O may issue the Vendor an order to stop work immediately and exercise their right to terminate the contract.

2.13.3 The Vendor shall provide the O/O with written notice of conditions adversely affecting performance. If after such notice the O/O fails to remedy the conditions contained in the notice within ten (10) working days the Vendor may exercise their right to terminate the contract.

2.13.4 The O/O shall be obligated only for the services performed in accordance with the RFP specifications prior to the date of termination notice.

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2.14 WAIVER

In the event of breach of contract or any provision thereof, the failure of the O/O to exercise any of its rights or remedies under this contract shall not be construed as a waiver of any such provision of the contract breached or as an acquiescence in the breach.

The remedies herein reserved shall be cumulative and additional to any other remedies at law.

SECTION 3.0 STATEMENT OF WORK

3.1 GENERAL INFORMATION

3.1.1 The following information is provided to assist the O/O in obtaining proposals for the scope of work necessary to accomplish the goals outlined herein. See also Section 6.0 of this document, Proposal Definitions, and review the information required in Section 4.4 for the Final Report and Section 3.4 for Monitoring Reports.

3.1.2 The Vendor may modify the scope of work; however, all modifications and justification for the modifications must be identified as such in the proposal. Modifications to the proposal must be approved in writing by KDHE prior to the initiation of work.

3.1.3 Vendor is responsible for ensuring work performed under this contract complies with all Federal, State, and local laws, as well as all applicable standard operating procedures (SOP’s) as included in the most recent version of the KDHE-Division of Environment Quality Management Plan (QMP) or directed by the KDHE Project Manager if it is determined by the KDHE that more rigorous operating procedures are warranted. The most recent version of the KDHE-Division of Environment Quality Management Plan (QMP) can be obtained from KDHE or from the KDHE website at: http://www.kdheks.gov/environment/qmp/qmp.htm.

3.1.4 Vendors will be responsible for ensuring resumes are on file with KDHE for all personnel working as field geologists, project geologists, licensed professionals, environmental scientists and sampling technicians.

3.1.5 KDHE reserves the right to reject any modification to proposals.

3.1.6 The investigation and monitoring scopes of work are each considered separate and unique. The accomplishment of the investigation scope of work does not guarantee that the monitoring scope of work will be required. However, if the monitoring scope of work is deemed necessary, it shall be the O/O’s responsibility to contract with a Vendor to accomplish the goals outlined herein.

3.1.7 Proposal Definitions can be found in Section 6.0 of this document.

3.2 SITE INFORMATION

3.2.1 Review the site specific information for each site in Exhibit 1. Conduct the work described therein following the requirements outlined in this document.
3.3 FIELD INVESTIGATION

3.3.1 Investigation Goals

3.3.1.1 Complete the investigation in accordance with all requirements outlined in this document.

3.3.1.2 Determine the horizontal and vertical extent, and concentration gradients of both soil and groundwater contamination. Identify all contaminant migration pathways.

3.3.1.3 Determine the leading edge of the groundwater contaminant plume.

3.3.1.4 Determine the soil type(s) and hydrologic properties of the unsaturated and saturated zones.

3.3.1.5 The Vendor is responsible for meeting the Investigation Goals outlined in this section and Section 4.0, Deliverables.

3.3.2 Drilling Equipment and Methods

3.3.2.1 Hollow stem augers must be used for all monitoring well installation drilling activities unless alternate drilling methods have been approved by KDHE in writing. An exception will be for monitoring well locations that have previously had continuous soil samples collected to the depth of groundwater using direct push methods. In this instance monitoring wells may be installed using solid flight augers.

If it is necessary to change the drilling methods and/or equipment, the Vendor will submit to the KDHE Project Manager a written description of the proposed change. The request must be submitted in writing from the Vendor. KDHE will review the information and provide the Vendor with a written response authorizing or denying the proposed change.

3.3.2.2 Direct push equipment will be allowed for borings that are exclusively installed for the collection of soil and hydrologic samples submitted for laboratory analysis. Samples collected must meet all laboratory and analytical method requirements. Direct push equipment will be allowed for the installation of groundwater monitoring wells as long as the rig is capable of turning the appropriate size augers. Continuous samples must be collected using a dual-tube, closed-piston, closed-tube or similar sampling method.

3.3.2.3 It is the full responsibility of the Vendor to evaluate the specific site geology and other relevant information in order to determine the drilling method(s) necessary to meet the requirements of the contract and complete the goals of the investigation at this site. Additional mobilizations of drilling equipment will not be reimbursed unless air or mud rotary methods are deemed necessary by KDHE to complete the well installations.
3.3.2.4 The selected drilling method(s) must be capable of completing the wells to the depth required without causing the migration or dilution of contamination.

3.3.2.5 In unconsolidated environments: if static groundwater level is 40 feet deep or less, the drill rig using hollow stem augers must have a minimum of 3,000-foot pounds of torque. If the static water level is greater than 40 feet deep and less than 70 feet deep, the drill rig using hollow stem augers must have a minimum of 5,500-foot pounds of torque. If the static groundwater level is greater than 70 feet deep and less than 100 feet deep, the drill rig using hollow stem augers must have a minimum of 7,000-foot pounds of torque. If the static groundwater level is greater than 100 feet deep, the drill rig using hollow stem augers must have a minimum of 10,000-foot pounds of torque.

3.3.3 Drilling and Sample Collection Procedures

3.3.3.1 Soil borings exhibiting soil contamination to groundwater must be completed as permanent monitoring wells provided that wells are adequately spaced to achieve the objectives of the site assessment. The determination of soil contamination will be based on field analysis.

3.3.3.2 Each borehole completed as a monitoring well must have a minimum borehole diameter of four inches larger than the outside diameter of the casing.

3.3.3.3 A Field Geologist will be onsite and oversee all drilling and well completion activities and perform all hydrologic testing activities. The Field Geologist will evaluate, describe, and record the lithology, moisture content, odor, and all other observations related to the geology of the site and contamination detected during drilling activities from surface to total depth.

3.3.3.4 Continuous soil samples will be collected using split spoon and/or continuous samplers. Duplicate soil samples will be collected from each interval as described in Sections 3.3.7.1, 3.3.7.5 and 3.3.7.6. All soil samples will be collected in this manner until groundwater is encountered or drilling is discontinued at the direction of the KDHE Project Manager. If alternate drilling methods are approved, collection of drilling samples for field screening and laboratory analysis will be up to the discretion of the KDHE Project Manager.

3.3.3.5 During the soil sampling process, one of the duplicate samples will be placed in a specified sample container for headspace analysis in the field. The other sample will be immediately placed in a KDHE Certified Laboratory approved sample container for laboratory analysis. Samples will be preserved as required by the analytical method. Samples used for headspace analysis will not be submitted for laboratory analysis.

3.3.3.6 The Project Geologist will stamp and sign the Final Report verifying that all the above drilling and sampling procedures were followed as specified in this RFP.
3.3.4 Monitoring Wells

3.3.4.1 Wells will be installed by a KDHE licensed water well contractor using approved drilling methods.

3.3.4.2 All monitoring wells must be securely covered until completed.

3.3.4.3 Unless directed otherwise by KDHE, a minimum of five (5) monitoring wells must be drilled and installed regardless of whether groundwater contamination is detected in the initial soil boring(s) unless the Vendor is directed by KDHE to discontinue drilling.

3.3.4.4 Monitoring well completions will meet or exceed the KDHE Standard Monitoring Well Design included as Attachment A with the following exceptions:

1) The screen seal will be a two-foot layer of hydrated bentonite (granular chips or pellets). The seal will be hydrated with at least five gallons of water for every 50 lb. bag of bentonite. Hydration will occur at a minimum after each bag has been placed in the annulus.

2) Wells where the screen seal is less than or equal to 40 feet bgs will be grouted with hydrated bentonite as described in #1 above, a flowable bentonite grout, or cement bentonite grout. Wells where the screen seal is greater than 40 bgs will be grouted using a flowable bentonite grout or cement bentonite grout. The flowable grout will be pumped through a tremie pipe with a diameter smaller than the well casing from the screen seal up to the depth specified in Attachment A. Under both scenarios neat cement grout will not be allowed.

3) Any changes to this design must be approved by the KDHE Project Manager in writing, once justification has been supplied regarding a variance from the original design.

3.3.4.5 Monitoring well completions less than 100 feet total depth shall be constructed using a minimum of 2 inch inside diameter (I.D.) casing and screen unless otherwise specified in the site-specific information. Monitoring well completions to a depth of 100 feet or greater shall be constructed using a minimum of 4-inch I.D. casing and screen.

3.3.4.6 Unless otherwise specified in Exhibit 1 the screen length will be based on estimated groundwater depth. Screen length must be based on the following groundwater depths: < 25 feet - 10-foot screens, 25 - 49 feet - 15-foot screens, 50 - 74 feet - 20-foot screens, 75 - 100 feet - 25-foot screens, > 100 feet - 30-foot screens. The screen shall be placed such that an equal amount of screen is above and below the static water level unless otherwise specified by the KDHE Project Manager.
3.3.4.7 Although the estimated or approximate depth to groundwater has been provided, the Vendor will be fully responsible for determining the actual depth to groundwater and completing the well(s) to the appropriate depth. For UST sites, the monitoring well(s) must be installed at a depth below the tank basin. For AST sites, the monitoring well(s) may be installed on top of bedrock. The KDHE project manager must be contacted prior to installing monitoring wells less than 15’ below ground surface.

3.3.4.8 The Vendor will be fully responsible for determining groundwater flow direction during the investigation in order to place monitoring wells to achieve the goals of the site assessment.

3.3.4.9 All monitoring wells must be properly developed (see Section 6.37 and Attachment C of this RFP). If wells are not sampled immediately following development, three casing volumes must be purged prior to sampling. Wells must be allowed to return to static water levels before sampling. Static water level is defined as the level at which water stands in a well that is not being affected by withdrawal. It is generally expressed as the distance from the ground surface (or from a measuring point near the ground surface) to the water level in the well. Static water levels must be measured twice, once prior to removing purge/development water and once prior to sample collection.

In low yield wells, the Vendor must allow the groundwater to return as close as possible to static conditions before taking a groundwater sample for analysis. If static conditions are not attained or if three well volumes of water cannot be purged before groundwater samples are taken, the Vendor must document the reasons. This should be included as part of the field notes and on Table 2.5 Groundwater Analytical Results.

3.3.5 Hydrologic Properties of the Site

3.3.5.1 Perform saturated zone tests to determine hydraulic conductivity and contaminant migration rates. The saturated zone tests used must be applicable to both the local geologic setting and the type of monitoring well completion proposed. Soil samples collected for saturated zone tests must be collected from a zone that is similar to the zone of probable chemical migration but located in an area that has not been impacted by any released substance. Soil samples collected for saturated zone tests must be collected from two different boreholes. Static water level will not be used to determine the zone of saturation.

3.3.5.2 Perform unsaturated zone tests to define the hydrologic characteristics of the unsaturated zone and determine whether the soils are conducive to soil vapor extraction remedial technologies. The tests must be conducted on samples from the lithologic zone(s) showing the highest concentration of contamination detected during field analysis. Soil samples collected for unsaturated zone tests must be collected from a zone that is similar to the zone of probable chemical migration but located in an area that has not been impacted by any released substance. Soil samples collected for unsaturated zone tests must be collected from two different boreholes.
3.3.5.3 If monitoring wells are completed in different geologic zones, a hydrologic test must be performed on each zone.

3.3.5.4 Determine the hydraulic gradient over the assessment area. Hydraulic gradient is the rate of change in total head per unit distance of flow in a given direction. The hydraulic gradient \( I \), is by definition the difference in hydraulic head \( (h_1 - h_2) \), divided by the distance \( L \), along the flow path.

\[
I = \frac{h_1 - h_2}{L} \text{ (feet/foot)}
\]

3.3.5.5 Determine the porosity of the unsaturated zone. There is no established method to determine porosity. Many laboratories use dry bulk density and specific gravity data to determine porosity using the following derivation:

\[
n = 1 - \frac{\rho_b}{\rho_s}
\]

Where,

- \( n \) = porosity (cc/cc)
- \( \rho_b \) = dry bulk density (g of dry soil/cc of soil)
- \( \rho_s \) = specific gravity of particle density (g/cc)

3.3.5.6 Two borings will be drilled specifically for the collection of hydrologic samples. These borings must be placed on separate areas of the site property.

3.3.6 Waste Disposal and Borehole Plugging

3.3.6.1 Soil borings not completed as monitoring wells will be plugged in accordance with all state regulations and guidelines as outlined in Attachment B. Note that all Trust Fund sites have been determined by the department to be contaminated (K.A.R. 28-30-7) until a Trust Fund investigation has been completed.

3.3.6.2 All waste soils and wastewater generated during the investigation will be treated and disposed of in accordance with all local, state, and federal statutes and regulations.

3.3.7 Field and Laboratory Water and Soil Sample Analysis

3.3.7.1 All borings/wells will be continuously sampled with split spoon samplers and/or continuous samplers until the saturated zone is encountered. Sand catchers will be used when necessary to maximize recovery in sand units. Duplicate soil samples for field screening and laboratory analysis will be collected from 5’ intervals to 25’ or less. The samples collected for field screening and laboratory analysis will be collected from the same two-foot interval showing the highest level of contamination within the five-foot intervals as determined by the field geologist.
The number of soil samples will be determined by the depth to the saturated zone and not based on the static water level. The static water level is not necessarily indicative of the saturated zone in all environments. Each boring/well must be evaluated independently. The KDHE project manager should be contacted if the saturated zone cannot be determined in the field. The Site Specific Information page in the bid package will estimate the number of soil samples to be collected per project. Costs will be denied if soil samples are not collected within the required interval (i.e. a sample collected from 4-6’ will be denied).

Surficial soil samples (0-1’) will be submitted for laboratory analysis if exposure to surface soils is currently a condition or is likely to be a condition in the future. Do not collect a 0-1’ if the surface of the boring is concrete or asphalt. Do not collect a 0-1’ sample if the surface of the boring has gravel greater than 6”.

For borings/wells when the saturated zone is ≤25 feet below ground surface, a soil sample will be collected every 5’ until the saturated zone is encountered. Soil samples must be collected from the unsaturated zone within the following unsaturated intervals: 0-1’, 1–5’, 5–10’, 10–15’, 15–20’, and 20–25’. The last soil sample will be collected immediately above the capillary fringe or bottom of the borehole.

For borings/wells when the saturated zone is >25 feet below ground surface, soil samples must be collected from within the following intervals: 0-1’, 1–5’, 5–10’, 10–15’, 15–20’, and 20–25’ for field screening and lab analysis. After 25’, soil from each 5-foot interval must be collected for field screening until the saturated zone is encountered.

3.3.7.2 A headspace analysis will be conducted on all unsaturated soil samples. The analysis must be conducted in the field at the time the samples are retrieved from the sampler. The analysis will be conducted using a photoionization detector, organic vapor analysis device, colorimetric tubes, or other field testing equipment approved by KDHE for hydrocarbon analysis.

3.3.7.3 Each duplicate sample collected for field analysis will be prepared as follows. Fill a clean glass quart jar or quart plastic bag half full of the sample to be analyzed, seal the jar or bag and let it stand until the sample reaches 70° F for a minimum of 15 minutes (allowing volatilization to occur) and a maximum of 60 minutes prior to testing. Jars must be decontaminated and dried before reusing. Plastic bags cannot be reused.

3.3.7.4 Drilling must cease after the last unstaurated laboratory sample is collected from each boring not completed as a well. Drilling must also cease after the collection of the required geotechnical samples from each boring.
3.3.7.5 The KDHE project manager must be informed if any of the monitoring wells are dry or inaccessible prior to sampling. KDHE may not reimburse for groundwater sampling if the site is sampled without the KDHE Project Manager approval. The vendor will be required by KDHE to return to the site to sample all wells, when the wells are accessible or contain water. KDHE will not reimburse for a second mobilization if the site was sampled without KDHE approval.

At least one groundwater sample will be collected from each monitoring well installed as part of the investigation except for wells containing Light Non-Aqueous Phase Liquid (LNAPL). Other water wells (i.e. public, private, monitoring, etc.) located within a 500-foot radius of the contaminant plume may also need to be sampled. If other wells are known or are found to exist within this radius, contact the KDHE Project Manager before beginning sampling to discuss which wells must be sampled. All groundwater samples will be collected within the same 24-hour period. If contamination is detected in any drinking water supply well the KDHE Project Manager or their supervisor must be notified by telephone as soon as possible. If any private or public water wells are sampled (i.e. lawn and garden, drinking, etc.), complete the Domestic Well Contact Form and submit with the final report. The form is located at http://www.kdheks.gov/tanks/rfp/index.html.

Two (2) groundwater samples from different monitoring wells installed during the investigation will be submitted for full VOC analysis. One of the groundwater samples submitted will be collected from the monitoring well installed at the contamination source or from the monitoring well which appears to contain the most highly contaminated groundwater. The other sample submitted will be collected from the furthest down gradient monitoring well.

One trip blank will accompany each groundwater sample container containing samples that will be submitted for VOC analysis. Trip blanks are not required for containers that contain only samples that will be analyzed for Low-Range Hydrocarbons (LRH), Mid-Range Hydrocarbons (MRH), High-Range Hydrocarbons (HRH), and/or PAH. Trip blanks are not required for containers that contain only soil samples.

Trip blanks must be obtained from the laboratory performing the analysis. Costs for analysis of any and all samples for which the required QA/QC data (see Appendix 4, Laboratory Data, under Section 6.0 Documentation in Section 4.4, Final Report Submittal) and requested sample replicates have not been submitted will not be eligible for reimbursement.

Split groundwater samples may be analyzed by the KDHE laboratory or one of KDHE’s contract laboratories. If the analytical results from the Vendor’s subcontracting laboratory cannot be confirmed by the QA/QC data and split sample analyses, the Vendor may be required to resample all monitoring wells at the Vendor’s expense. Results will be considered acceptable if the percent difference between the Vendor’s lab and the next closest lab’s results does not exceed 25%.
3.3.7.6 Groundwater samples will not be collected for laboratory analysis if LNAPL is present in the well. The Vendor shall record in the field notes a complete description of the LNAPL including thickness, color, odor, and viscosity and indicate the type of LNAPL suspected.

3.3.7.7 A sample of the LNAPL will be collected and analyzed by a laboratory certified by KDHE. If LNAPL is detected in more than one well, collect only one LNAPL sample unless it is suspected, based on the potential sources and LNAPL appearance, that the LNAPL type or mixture of types differs in different wells. The analysis will indicate the type(s) of fuel detected.

3.3.7.8 All laboratory analyses will be performed by a laboratory certified by KDHE for the specific analyte(s) and laboratory method.

3.3.7.9 All samples designated for laboratory analysis will immediately, upon collection, be containerized and sealed in a sample container laboratory approved for the constituent of concern and will be properly preserved and transported to the laboratory. LNAPL samples will be transported in a separate container from groundwater and soil samples.

3.3.8 Property Access

3.3.8.1 The Vendor is responsible for contacting all onsite and offsite property owners to obtain access. Required property access includes all properties that have a probe, soil boring or monitoring well located on the property in the KDHE approved Field Work Plan. Property access also includes accessing a property to sample an existing monitoring, domestic or lawn and garden well.

Written authorization will be obtained from the owner of each property where access is necessary. Written permission is also necessary when utilizing KDOT, city/county, and utility easements. When easements are utilized the vendor must also obtain written permission from the property owner. Initial contact may be verbal, but written permission must be obtained from each owner of each property and or easement to be accessed prior to mobilizing equipment to the site to begin direct push and/or drilling operations. The Vendor will not be reimbursed for costs associated with drilling and installation of wells on properties where access was not obtained. The vendor will also be required to plug the wells, at the vendor's expense, where access was not obtained.

At least two written and two verbal attempts to obtain access will be made. If access is denied from the property owner or no response is received within three weeks of the initial contact, the KDHE Project Manager must be notified in writing. Written notification must include copies of letters sent, phone records, field notes, any additional supporting documentation, and request KDHE’s assistance in acquiring access. KDHE assistance does not relieve the Vendor of their responsibility to obtain access. KDHE may grant the use of the easement without written permission from the property owner on a property specific basis. KDHE’s permission must be obtained in writing.
3.3.8.2 Copies of all signed access agreements must be included in Appendix 5 of the Final Report. If applicable, a copy of the written permission from KDHE granting the use of the easement without written permission from the property owner.

3.3.8.3 The Vendor is expected to act in a professional and respectful manner to any local and agency authorities, utility companies, and the public in general when requesting access.

3.3.9 Property Restoration

3.3.9.1 Any property damaged or destroyed during implementation of the project must be repaired to its original condition within 30 calendar days after the damage or destruction has occurred. All damaged property (i.e. utilities, product lines, electrical supplies, etc.) will be repaired or replaced at Vendor’s expense. Failure to restore the property to (at least) original condition within 30 calendar days will result in holding of retainage until restoration is complete. Failure to restore the property could result in disqualification from KDHE Trust Fund work.

3.3.9.2 Vendor must notify KDHE District and Topeka offices immediately and describe the situation and affected utility or infrastructure.

3.3.9.3 Utilities damaged by Vendor, or their subcontractors, will be repaired by Vendor. All repairs must be made by a qualified, bonded, and licensed professional, and must be completed in a period agreeable to the affected party and the utility. Losses including business costs, hours of operation, equipment malfunctions, decrease in staff hours, etc. will be the responsibility of Vendor.

3.3.9.4 If any landscaped areas are disturbed during construction activities, restoration must be completed by a Landscaping Professional. Documentation of the restoration will be required.

3.3.9.5 If any professionally landscaped areas are disturbed during investigation activities, the Vendor must contract with a Landscape Professional to conduct the necessary repairs. Documentation of the contract is required.

3.3.10 Monitoring Well Surveying

3.3.10.1 Subsequent to completion of the assessment phase field work, all monitoring wells must be surveyed by a Registered Land Surveyor (RLS). If surveying of any existing wells is included in the scope of work in Exhibit 2, or if existing wells are found during the investigation and the KDHE Project Manager directs the Vendor to sample and/or survey the wells, all wells must be surveyed during the same RLS mobilization and be included in one survey report. A copy of the survey report must be included in Appendix 5 of the Final Report.

3.3.10.2 Establish a permanent datum control point (benchmark) onsite.
3.3.10.3 The site benchmark will correlate to sea level datum (U.S.G.S. or N.G.S. elevations) within an accuracy determined by the following formula:

\[
\text{degree of accuracy (in feet)} = 0.1 \times \sqrt{\text{distance (in miles)}}
\]

3.3.10.4 Identify and document all benchmarks used in determining the site benchmark.

3.3.10.5 Install a permanent datum control point for each monitoring well (i.e. a surveyor’s bolt mounted flush within the concrete pad or permanent mark on the flush mount rim).

3.3.10.6 The datum point for each monitoring well will be recorded within 0.01 vertical feet accuracy relative to the site benchmark.

3.3.10.7 Determine the distance in feet north and west from the southeast corner of the section containing each monitoring well (do not use State Plane Coordinates). Survey report will include the section township and range location to four quarters for each monitoring well. Determine the latitude and longitude to 5 decimals using a GPS instrument.

3.3.10.8 Establish to within 0.01 vertical feet relative to the site benchmark, and permanently mark on the well casing, the point from which depth to groundwater will be measured.

3.3.11 Full Site Survey and Map

3.3.11.1 The full site survey will only be completed during the LSA addendum. If a full site survey is planned, the line item will appear on the bidsheet and costs must be provided during the bid process. The full site survey must be conducted by a Kansas licensed land surveyor. The work product will be developed using standard survey equipment and standard industry practices.

3.3.11.2 Establish a permanent datum control point (benchmark) within the property boundaries of the facility under study. The site benchmark will be a permanent mark (survey bolt, cross-cut, etc.) on a permanent site structure, such as a building foundation. Concrete pads or survey pins associated with wells or soil borings cannot be used as the site benchmark. The site benchmark will correlate to sea level datum (U.S.G.S. or N.G.S. elevations) within an accuracy determined by the following formula: degree of accuracy (in feet) = 0.1 x the square root of the distance (in miles) from the nearest vertical datum control point to be used. Identify and document all benchmarks used in determining the site benchmark. Install a permanent datum control point for each monitoring well (i.e. a surveyor's bolt mounted flush within the concrete pad or permanent mark on the flush mount rim). The datum point for each monitoring well will be recorded within 0.01 vertical feet accuracy relative to the site benchmark. Determine the distance in feet north and west from the southeast corner of the section containing each monitoring well. Survey report will include the section township and range location to four quarters for each monitoring well.
Determine the latitude and longitude of the site using a GPS instrument. GPS information will be reported to 5 decimals. Establish to within 0.01 vertical feet relative to the site benchmark, and permanently mark on the well casing, the point from which depth to groundwater will be measured.

3.3.11.3 A site survey map will be prepared from the site survey data. The location of the site benchmark and NGS benchmark will be indicated on the site survey map. The map will show the surveyed locations of all site features, including, but not limited to, property boundaries, buildings, overhead structures, test wells, monitoring wells, roads and driveways (center lines indicated), underground and overhead utility lines, manholes, storm sewer and catch basins, aboveground and underground storage tanks, fuel dispensers, fuel supply lines, paved areas, gravel areas, grassy areas, drainage ways, bridges, culverts, trees and fences. Dimensions of all paved areas will be measured, and the type of paving material indicated. Flow directions for sewer and water lines will be indicated by arrows on the site map.

3.3.11.4 Buildings and other rectangular structures will be located by surveying a minimum of two corners, and the dimensions measured. Free-standing cylindrical structures should be located by two points and the diameter stated. Grain elevators on pads and aboveground storage tanks within a containment structure can be located by measurements from the pad edge or containment walls. The material, wall height, and measured dimensions of aboveground storage tank containment structures will be recorded.

3.3.11.5 The surveyor’s report will include at a minimum:
1) All field notes.
2) Tabulated latitude and longitude of all monitoring wells and test wells.
3) Tabulated elevation of permanent measuring points on well casings and survey pins associated with test wells and monitoring wells.
4) A full site survey map with a North arrow, map scale, site benchmark, and legend.

3.3.11.6 The site survey map must be stamped, dated and signed by the Kansas licensed land surveyor.

3.3.11.7 A copy of the surveyor report and map must be included in appendix 5 of the LSA report.

3.4 MONITORING FIELD WORK

3.4.1 The One Year Post LSA Monitoring scope of work, including report submittals, will be conducted in accordance with the most recent Monitoring RFP. The Monitoring RFP can be accessed at http://www.kdheks.gov/tanks/rfp/index.html.
SECTION 4.0 DELIVERABLES

4.1 PRE-CONTRACT SUBMITTALS

The Vendor is required to submit as a part of the proposal each item requested in the order and format provided below. Certain items (*) will remain on file with KDHE and, once submitted, re-submittal will be necessary only when changes are made. The Vendor must specifically state each item omitted from the submittal package and include an explanation.

4.1.1 A cover letter from the Vendor itemizing submitted documentation.

4.1.2 ACORD 25 Certificate of Insurance with the Certificate Holder as: *

    KDHE – BER – STS
    Attn: Contractual Services Unit
    1000 SW Jackson St., Ste. 410
    Topeka, KS  66612-1367

4.1.3 KDHE-BER-Storage Tank Section Vendor File Resume Vendor File Resumes of all personnel expected for the project and current OSHA safety training certification of all personnel proposed to conduct field activities for the project.* The KDHE-BER-Storage Tank Section Vendor File Resume Vendor File Resumes can be found at http://www.kdheks.gov/tanks/trust_fund/index.html.

4.1.4 Complete list of equipment.*

4.1.5 Drill rig specifications.*

4.1.6 Quality Assurance and Quality Control (QA/QC) plan.*

4.1.7 Workers Compensation Log & Summary of Occupational Injuries & Illness (OSHA forms 300 and 300A).*

4.1.8 Completed W-9.*

4.1.9 List of all subcontractors with a description of their duties and, if applicable, copies of their OSHA safety training certificates. If the subcontractor is to serve as the Vendor’s Field Geologist, Licensed Professional, Project Geologist, Sampling Technician or Environmental Scientist, a copy of their KDHE-BER-Storage Tank Section Vendor File Resume is to be submitted to the KDHE Contractual Services Unit indicating their qualifications as outlined in Section 1.4, Definitions. The Vendor is solely responsible for ensuring all personnel and subcontractors obtain and maintain applicable licenses, certifications, and training as required by Federal, State, and Local governments in addition to satisfying the minimum qualifications required in this RFP.
4.2 FIELD WORK PLAN SUBMITTALS

4.2.1 The Vendor will complete and submit two copies of the Field Work Plan (Attachment D) with all required maps and photos to KDHE after the contract between the O/O and Vendor has been signed by all parties. Field Work Plans must be submitted by U.S. Mail. Fax or e-mail copies will not be accepted unless authorized by the KDHE Project Manager. Incomplete Field Work Plans will be returned without review.

Field Work Plans will include, at a minimum, six photographs taken of the facility or site from different angles of views. The tank basin and/or pump islands must be outlined in the photographs. Photographs will be color prints and be taken by an employee of the Vendor. The Vendor employee who performs field activities for Field Work Plan preparation and prepares the Field Work Plan worksheet must be an Environmental Scientist, Field Geologist, or Project Geologist.

The Field Work Plan states specific equipment and procedures will be used while field work is being conducted, including, but not limited to, rig type, screening and sampling equipment, decontamination procedures, waste handling procedures and qualified field personnel. The specific equipment, procedures and personnel stated in the Field Work Plan must be used in the field. Changes to the approved Field Work Plan must be submitted in writing and approved by the KDHE Project Manager.

4.2.2 The Vendor will insure all soil borings and monitoring wells located on the approved Field Work Plan can be drilled and/or installed at the exact locations as plotted on the Field Work Plan. The Vendor will insure that all features on the approved Field Work Plan are correctly plotted and to scale. Examples include, but are not limited to, utilities, overhead lines, buildings, fences, flora, easements, streets, property boundaries, etc. KDHE will not reimburse for Field Work Plans if any soil boring or monitoring well cannot be drilled as plotted on the approved Field Work Plan.

4.2.3 Field Work Plans must be approved prior to mobilization to the site for field work activities. KDHE will review the Field Work Plan and provide written comment, or if approved, written authorization for the Vendor to proceed, within ten (10) working days following the date KDHE receives the plan. Field Work Plans will not be reviewed until verification of the required insurance (Section 2.9, Insurance) has been received by the KDHE Project Manager.

4.2.4 The Vendor may request from KDHE that written authorization to proceed be sent in the U.S. Mail to the Vendor’s office at the address provided by the Vendor, or by e-mail to the Vendor’s office at a number or e-mail address the Vendor provides. Unless otherwise requested by the Vendor, written Notice to Proceed will be sent by U.S. Mail to the contact person provided by the Vendor.

4.3 WORK NOTIFICATION REQUIREMENTS

4.3.1 The Vendor will notify the KDHE Project Manager and KDHE District Office Representative a minimum of seven (7) days prior to initiation of all field work by completing the online Field Activities Notification Form. This form is required for all field work (i.e. soil borings, monitoring well installation, plugging, monitoring, etc.). The Field Activities Notification Form is located on the KDHE website.
4.3.2 The Vendor will notify the O/O, current property owner, current site tenant, owners and tenants of any property on which any field work (i.e. soil borings, monitoring well installation, plugging, monitoring, etc.) is to be performed by telephone or in writing at least seven (7) days prior to initiation of field work.

4.3.3 Schedule changes must be reported to the O/O, the KDHE Project Manager and District Office Representative in the same manner as in Sections 4.3.1 and 4.3.2. Approval to proceed with any field activities mentioned in 4.3.1 and 4.3.2, after a schedule change has been reported, must be approved by the KDHE Project Manager.

4.4 FINAL REPORT SUBMITTAL

4.4.1 A Final Report will be completed for each facility. Each Final Report will be a summary of all work performed and all data requested and gathered during all activities conducted under the assessment phase of this contract.

All tables and figures must be legible in color as well as black and white. If shading is used, it must be light enough to see all attributes of the tables and figures. These documents are public record and must be able to be clearly reproduced.

The Vendor will submit one copy of the Final Report for each site within 160 days after the contract between the O/O and Vendor has been signed by all parties. Incomplete final reports will be returned without review. The submittal deadline will not be considered to have been met until a complete report demonstrating that the investigation goals have been met is received by KDHE.

Upon approval of the Final Report, one electronic copy, in Adobe format (.pdf), must be submitted to KDHE on a CD. KDHE may also request electronic files in original format at no additional cost. The final report must contain a sleeve for storage of the CD.

4.4.2 One copy of the Final Report will be submitted to the respective O/O. The Vendor may wait until the Final Report has been reviewed and approved by KDHE before providing the O/O with a copy. If the Vendor provides the O/O with a copy prior to approval of the report, copies of any and all revisions and/or addenda must also be provided to the O/O.

4.4.3 Each Final Report will be bound and include a cover page with the following information: report title; KDHE site name; site address; KDHE project code; KDHE Facility I.D. number; report date (month, day, year); and the name of the person who prepared the report. Cover page must be stamped and signed by a Kansas Licensed Geologist.

Each Final Report will include a table of contents with the following information. Omitted figures or appendixes must be clearly labeled in the table of contents.

1) section titles (see 4.4.4 below) for sections 1-6,
2) titles and page numbers for tables 2.1-2.8,
3) titles for figures 1-8,
4) titles for each appendix in Section 6.0, Documentation.

Each Final Report will include labeled tabs for each Section title (see 4.4.4 below) and each appendix.
4.4.4 Final Report Submittal

Each Final Report will include all information outlined below in the format and order described. Figures and tables not applicable to the site must be so noted in the table of contents. Do not change the item numbers designated below. Items within tables that may not be applicable, such as LNAPL thickness, must be stated in the table to be not applicable.

SECTION 1.0 SITE SUMMARY

The site summary section will include the following information.

1.1 General Summary

1) Include a detailed summary of all past and present work performed at the site.
2) Identify any nuisance conditions associated with the release(s) from the site.
3) Determine if any drinking water wells or surface waters have been impacted by a release from the site.
4) State if public water is being supplied to the site and surrounding areas.
5) Identify potential source areas, migration pathways, and receptors.
6) Document any ordinances preventing or influencing the future installation of water wells at the site or in the surrounding area such as groundwater protection areas.
7) Identify sensitive receptors, such as surface water bodies, wildlife sanctuaries, and wetlands.

1.2 Regional Geology

1) Review local and regional geologic and/or hydrogeologic maps, nearby site assessments and/or investigation reports and any other pertinent publications.
2) Identify any aquifers and/or surface water bodies serving as sources of drinking water for the area.
3) Identify and evaluate the use and/or potential use of the uppermost groundwater zone and/or impacted groundwater zones within 1/4 mile of the source of the release at the facility.

SECTION 2.0 TABLES

Tables must be labeled with KDHE site name, KDHE project code and the numbers and titles provided below. Number each page of tables. Include in the table a column for each numbered item requested. Column headings must be included on each page. Do not reference or include in this section, any discussion, tables, maps, photographs, drilling logs, or other documents included in this report. Abbreviations or material referenced from other publications must be explained at the bottom of the table.
Table 2.1 Summary of Work Completed

Include the following information for work completed:

1) total number of plugged borings,
2) total number of monitoring wells completed,
3) total footage drilled,
4) total monitoring well footage,
5) total boring footage plugged,
6) total number of groundwater samples analyzed by laboratory,
7) total number of soil samples analyzed by laboratory,
8) total number of LNAPL samples analyzed by laboratory,

Samples collected for saturated and unsaturated zones tests, properties and data included in Tables 2.7 and 2.8 and samples analyzed for offsite waste disposal must not be included in the total number of soil samples analyzed by laboratory.

Table 2.2 Water Well Information

Include the following information for all Public Water Supply, domestic, and lawn and garden wells located within a 1/4-mile radius of the site. Monitoring wells and plugged wells should not be included in the table.

1) the well owner’s name and address,
2) the use; select the use from those found in Section 7 of the WWC-5 form that best describes the use of the well,
3) the distance in feet between the well and contaminant plume,
4) the location of the well relative to the contaminant plume and groundwater flow direction.

The search for this information must include at least the following: 1) a water well records search conducted through the Kansas Geological Survey, 2) a discussion with city and/or county personnel concerning the location of public and private water supplies for the area, and 3) a ground or house-to-house reconnaissance of the area within the contaminant plume(s) and a 500 foot radius surrounding the source of contamination. PWS wells must be designated with the same numbers assigned by the city, water district, or other well owner.

Table 2.3 Well Completion Information

Include the following information for each well installed or sampled:

1) boring and/or monitoring well ID number assigned by the consultant,
2) well ID number from KDHE numbered well lock,
3) the surveyed elevation of the top of well casing,
4) the depth to groundwater below top of well casing in feet prior to development/purging,
5) the depth to groundwater below top of well casing in feet prior to sampling,
6) static groundwater elevation prior to purging (or development if wells are sampled the same day as development and the wells are not purged),
7) total depth of well,
8) the date static water level was measured prior to development/purge,
9) the thickness of the LNAPL (if applicable).

Groundwater levels must be measured under static conditions within the same 24-hour period.
**Table 2.4 Soil Field Screening and Laboratory Results**

Include the following results for each field sample, including those not submitted for laboratory analysis, and each laboratory sample collected from a boring:

1) boring and/or monitoring well ID (see Table 2.3),
2) the interval from which each sample was collected,
3) the field screening results in parts per million (ppm),
4) the concentration of each specified constituent in parts per million (ppm) determined by laboratory analysis; state the petroleum product(s) identified*,
5) the date each sample was collected,
6) The EPA testing method and laboratory detection limit (DL) for each constituent. If a constituent was not detected, place “ND” in the appropriate column with the detection limit noted in parenthesis [i.e. ND (5)]
7) the field instrument used for each field screening sample,
8) Tier 2 Risk-Based Screening Levels for each chemical of concern for both soil and soil to groundwater pathway for both residential and nonresidential scenarios.

* Constituents are, Benzene, Toluene, Ethylbenzene, Total Xylenes, 1,2 Dichloroethane (1,2 DCA), Methyl Tertbutyl Ether (MtBE), Naphthalene, Ethylene Dibromide (EDB), LRH, MRH, and HRH.

**Table 2.5A Groundwater Analytical Results**

Present all results for each sample point. Private wells and PWS wells must be designated consistently throughout the report. Include the following information for each groundwater and LNAPL laboratory sample:

1) well ID number (see Table 2.3),
2) the concentration of each constituent, in parts per billion (ppb)*,
3) the product(s) identified, or approximate % of each product if a mixture, for any LNAPL sample(s),
4) the volume, in gallons, of water removed from each well during well development,
5) the volume, in gallons, of water purged from the well prior to sampling,
6) the date the well was purged,
7) the date each sample was collected,
8) The EPA testing method and laboratory detection limit (DL) for each constituent. If a constituent was not detected, place “ND” in the appropriate column with the detection limit noted in parenthesis [i.e. ND (5)]. NOTE: The Total BTEX will not be a total of the detection limits; only the constituent results detected.
9) Tier 2 Risk-Based Screening Levels for each chemical of concern for groundwater pathway for both residential and nonresidential scenarios.

*Constituents are Total BTEX, Benzene, Toluene, Ethylbenzene, Total Xylenes, 1,2 Dichloroethane (1,2 DCA), Methyl Tertbutyl Ether (MtBE), Naphthalene, Ethylene Dibromide (EDB), LRH, MRH, and HRH. The highest Naphthalene or EDB detected from the two sampling methods must be reported in Table 2.5. If the Naphthalene or EDB is ND, report the lowest detection limit.
Table 2.5B Groundwater Analytical Results

Present all results for each sample point from Full VOC Scan and Full PAH Scan. Include the following information for each groundwater laboratory sample:

1) well ID number (see Table 2.3),
2) the concentration of each constituent, in parts per billion (ppb)*,
3) the date each sample was collected,
4) The EPA testing method and laboratory detection limit (DL) for each constituent. If a constituent was not detected, place “ND” in the appropriate column with the detection limit noted in parenthesis [i.e. ND (5)].
5) Tier 2 Risk-Based Screening Levels for each chemical of concern for groundwater pathway for both residential and nonresidential scenarios.

*Only list the constituents that have a detection from these scans. For the remaining constituents, add a footnote to the table indicating they are Non-detect (ND).

Table 2.6 Unsaturated Zone Hydrologic Tests and Properties

Include the following information for each unsaturated zone hydrologic test conducted. In the event unsaturated zone tests were not required or obtained, the table must be completed from a published source based on the lithology of the site. Identify source(s) of information for values not acquired during this scope of work in a footnote below the table.

1) the well and/or boring ID number (see Table 2.3),
2) the depth at which each sample was collected, including interval,
3) the analysis method name and number,
4) the sample collection method,
5) the lithologic description of each sample,
6) estimated porosity (cm³/cm³),
7) gravimetric water content (g/cm³) (ASTM Method D2216),
8) volumetric water content (cm³/cm³) (calculation from ASTM Method D2216),
9) dry bulk density (g/cm³) (ASTM Method D2937),
10) specific gravity (g/cm³) (ASTM Method D854),
11) organic matter (% organic matter) (ASTM Method D2974),

Note: The calculation for porosity is calculated using the following derivation:

\[ n = 1 - \frac{\rho_b}{\rho_s} \]

Where:

\( n = \) porosity (cm³/cm³)
\( \rho_b = \) dry bulk density (g of dry soil/cm³ of soil)
\( \rho_s = \) specific gravity or particle density (g/cm³)
Table 2.7 Saturated Zone Hydrologic Tests and Properties

Include the following information for each monitoring well used for the saturated zone tests. In the event saturated zone tests were not required or obtained, the table must be completed from a published source based on the lithology of the site. Identify source(s) of information for values not acquired during this scope of work in a footnote below the table.

1) the monitoring well or boring ID number (see Table 2.3),
2) the depth at which each sample was collected, including interval,
3) the analysis method name and number (ASTM, EPA) for the grain size analyses and/or the permeability tests,
4) the hydraulic conductivity value in centimeters per second (cm/sec) determined for each test,
5) hydraulic gradient (ft/ft)
6) known or estimated yield of uppermost aquifer within a 24-hour period (provide source).

SECTION 3.0 FIGURES

All figures must be current and reflect the properties on and off site at the time drilling operations were completed. Maps must be CAD drawings or enhanced versions of the most recent aerial photographs of the specified area. Topographic maps will not be accepted. Figures must be drawn to scale and labeled with the titles provided. Do not reference or include in this section any discussion, tables, photographs, drilling logs, calculations or other documents included in this or any other report. Figures are required to be single-sided. Include the following information on each figure:

1) a north arrow, scale, and legend. Legends must include only those items that occur at the site;
2) all labels necessary to describe information requested for specific maps;
3) all roads/alleys must be included and labeled;
4) KDHE site name and KDHE project code;
5) locations of all property right-or-ways, buildings, driveways, and other fixed objects on the site property;
6) all current and former tank basins, pump islands, and product lines on and off site;
7) clearly outline the site boundary at the time of release. The site boundary may be different than the property boundary;
8) location of property boundaries and buildings for offsite properties;
9) all adjacent and site property use, property owners name, and business names;
10) properties where access has been denied, including property owner’s name and date of denial;
11) project codes and names of other active and closed LUST projects visible on the figures;
12) Public water supply, domestic, and lawn and garden wells must be designated consistently throughout the report.

The scale for figures 3 through 6 must be approximately 1” ≤ 50 feet for smaller sites and 1” ≤ 100 feet for larger sites. The scale for figures 4, 5, and 6 may be adjusted to enlarge the area of the plume if the plume is small, provided that sufficient site features are shown to identify the area mapped. Maps will be 8½” x 11” or 11” x 17”. If warranted, the KDHE Project Manager must be contacted for approval to use a scale or figure size other than specified herein.
Figure 1  General Site Location

A map adapted from a USGS 7.5-minute quadrangle, depicting the site location and a one-mile radius of the site. The one-mile radius must be clearly marked. Highlight or mark the location of the site. Contours and other information must be clear and legible.

Figure 2  Area Base Map

Two area base maps will be included in the report. The maps will be enlarged such that the facility is located at or near the center of the map. Figure 2.1 will depict the site and a minimum 500-foot radius around the source(s) of contamination or the complete area of the investigation, whichever is greater and will have an approximate scale of 1” = 125’. Figure 2.2 will be a detailed site map with a scale of 1” = 50’. Maps must be on 8 ½” x 11” or 11” x 17” paper.

The following must be included on both maps:

1) all soil borings and wells;
2) locations of all underground utility trenches and overhead lines within 100 feet of the contaminant plume(s), and all utilities or subsurface structures reported in the private property locates. State the type and depth of each utility service;
3) basements (a door to door search for basements must be made within a 500-foot radius of the source of contamination). Make a note on the map if no basements were located.

Figure 3  Groundwater Flow Map

A map, adapted from Figure 2, representing the exact location of the site benchmark(s) and each well relative to the site benchmark. Label each well with the well ID, the elevation of each well (casing), static groundwater elevation prior to development/purge, labeled equipotential contours encompassing all water measurement points, and arrow(s) indicating predominant flow paths and direction. Use all points (except anomalous points) measured for the investigation when contouring. Anomalous data points must be noted on the map. Do not use the adjusted static water level for any wells with LNAPL present, they should be considered anomalous. Show flow line used for calculating hydraulic gradient. Do not include soil borings.

Figure 4  Soil Isoconcentration Maps

Use Figure 2 as the template, figures will have an approximate scale of 1” = 50’ or larger. These figures will be enlarged to clearly indicate the location of all wells/borings from which analytical soil samples were collected. The estimated areal extent of soil contamination, above the capillary fringe, must be outlined down to non-detect (ND) levels, for all soil contamination maps outlined below.

Use the highest soil laboratory analysis from above the capillary fringe in each boring. Develop isocontours if the contaminant distribution is suitable. Label sample points with the boring/well ID number, the concentration in ppm, and the interval at which each sample was collected. In the event all intervals are ND, please include ND for all depths for the applicable borings/wells, (i.e. ND 0-25’). Label all isoconcentration lines with the concentration in ppm. If the contaminant being mapped was detected in less than three sampling locations, submit a map showing the sample points labeled with the concentration in ppm but do not contour. If the constituent being mapped was not detected in any boring, omit map.
4.1 Benzene in Soils
4.2 Naphthalene in Soils

**Figure 5  Groundwater Isoconcentration Maps**

Develop all groundwater isoconcentration maps outlined below. Use Figure 2 as the template and show all monitoring wells and sampling points, with ID numbers LNAPL thickness in feet, sampled during the investigation. Do not include soil borings. Label sample points with the well ID number and the concentration in ppb. Label all isoconcentration lines with the concentration in ppb. If the constituent being mapped was detected in less than three sampling locations, submit a map showing the sample points labeled with the concentration in ppb but do not contour. If the constituent being mapped was not detected in any well, omit map.

5.1 Total BTEX in wells
5.2 Benzene in wells
5.3 1,2 Dichloroethane (1,2 DCA) in wells
5.4 MtBE in wells
5.5 Naphthalene in wells
5.6 EDB in wells
5.7 LRH in wells
5.8 MRH in wells
5.9 HRH in wells

**Figure 9  Geologic Cross Section – A**

The cross section must be completed during the LSA addendum. If a LSA addendum is planned, the line item will appear on the EXHIBIT 2 Project Bid Proposal sheet and costs must be provided during the bid process. Construct a geologic cross section plotted relative to actual mean sea level elevations of monitoring wells, of the area with the highest level of soil contamination at the site based on all available data, using a minimum of three bore holes. Cross Sections must be submitted on at least 11” x 17” inch paper. Each cross section must include the following information:

1) Sediment units of each boring and a legend
2) All field screening data, laboratory analytical results and product thickness plotted relative to depth
3) Estimated water table
4) Potential receptors or flow paths for contaminant/vapor migration
5) Vertical and horizontal scale bars with vertical exaggeration noted
6) Reduced map of the site with wells and borings plotted that depicts the orientation and labeled reference points for the sections

**Figure 10 Geologic Cross Section – B**

The cross section will be completed during the LSA addendum. If a LSA addendum is planned, the line item will appear on the EXHIBIT 2 Project Bid Proposal sheet and costs must be provided during the bid process (only required if six or more borings advanced; same requirements as listed in Figure 9)
SECTION 4.0 DRILLING LOGS

Include schematics for each boring drilled and each monitoring well installed during the investigation. At a minimum, the following information must be included on each log:

1) the KDHE site name and KDHE project code,
2) the boring and monitoring well ID number,
3) the date the drilling was conducted,
4) The date potholing was conducted must be included if well installation was not completed on the same day.
5) the names of the Driller and Geologist,
6) the drilling method/type of drill rig, soil sampling equipment including length & diameter, and field screening analysis equipment used,
7) borehole and casing diameters,
8) field screening results plotted at the depth measured,
9) a continuous soil profile will be developed with detailed lithologic descriptions using the Unified Soil Classification System (USCS) from surface to bottom of the boring/well. The detailed lithological descriptions must correspond to the depths measured during drilling. The profile will also include the color, texture, sorting, size and shape of grains, and any other pertinent information,
10) observations such as fracturing or solution cavities, organic content, staining, odor, moisture changes (dry, moist, saturated), and any other pertinent features,
11) a monitoring well construction diagram that accurately depicts the depth of the screen, blank casing, filter pack, screen seal, grout seal, well-head completion, and the surveyed elevations of the top of the casing and the permanent datum control point (see Section 3.3.10.5) on the pad or flush mount rim,
12) for plugged borings, plugging material and interval of each material, including surface completion,
13) depth the saturated zone was encountered during drilling and elevation of static water level prior to development/purge,
14) indicate where laboratory and hydrologic samples submitted for laboratory analysis were collected, including interval.

If applicable, all of the above information must be shown on the same page and be drawn at the same vertical scale. Logs must be typed and have the same appropriate scale. Do not use abbreviations. Do not reference or include in this section any discussion, tables, photographs, maps, or other documents included in this or any other report.

SECTION 5.0 PHOTOGRAPHS

Include at a minimum the following color photographs, two photographs per page.

1) Two photographs of the entire facility from two distinctively different directions.
2) Two photographs identifying the current and/or former tank basin(s), above ground tank location(s), or other system components that were identified as the source(s) or potential source(s) of contamination. Outline the aerial extent of the tank basin(s) and line trench(es). Identify in the description any remediation system components.
3) One photograph of each monitoring well completed by the Vendor as part of this investigation. Include the well number in the description.
4) One photograph showing the scarified soils onsite in relation to a property landmark. The location of the soils should be included in the description.
Photographs must be current and reflect the property condition at the time drilling operations were completed. All photographs must be color prints or color copies. Photographs must be taken from an appropriate distance and angle for the subject to be clearly visible and identifiable. Do not reference or include in this section and discussion, tables, drilling logs, maps or other documents that are included in this report. Each photograph shall illustrate the spatial relationships of the various components at the site. Each photograph must include a description of the scene, the direction the picture was taken from, and the date of the photograph.

SECTION 6.0 DOCUMENTATION

Include all information requested in the following format. Do not reference or include in this section any discussion, tables, photographs, maps, or other documents that are included in this report or any other report.

Appendix 1 Unsaturated Zone Hydrologic Data

Include all raw data (ASTM data sheets, laboratory test data, sieve analysis results, grain size distribution plots, etc.). Include all information submitted by the laboratory on sheets provided by the laboratory and the chain of custody forms. Provide all formulas with detailed calculations used to determine the unsaturated zone hydrologic characteristics.

Appendix 2 Saturated Zone Hydrologic Data

Include all raw data (plots of graphical analyses, laboratory test data, sieve analysis results, grain size distribution plots, etc.) and chain of custody forms. Provide all formulas with detailed calculations used to determine the saturated zone hydrologic characteristics.

Appendix 3 Laboratory Data

Include all analytical laboratory reports and Chain of Custody documents. Reporting limits for all samples must be the Practical Quantitation Limit (PQL) for that sample. Reporting limits set at the Maximum Contaminant Limit (MCL) are not acceptable. Include results of LNAPL analyses (including laboratory chromatographs) if LNAPL samples were collected. All lab reports must include the following QA/QC data for all samples:

- Calibration check against the true value or initial calibration every 20 samples. This should be a mid-range calibration.
- Surrogate % recovery for each soil and water sample.
- Matrix spike and duplicate for each constituent every 20 samples or each run, whichever is more frequent.
- Method blank and duplicate for each extraction.
- Trip blank for each shipping container containing groundwater samples submitted for VOC analysis.
Appendix 4  Field Notes

Field notes must be signed by the individual who performed the work described therein. Each page must be signed as the notes are being taken. Include copies of the following:

1) all drilling logs, soil sampling notes, and monitoring well completion notes, drill logs will include a clear indication of where the saturated zone was encountered during drilling,
2) groundwater sampling notes recording, for each well sampled, the water depth and total depth; the volume, in gallons, of water removed for well development (see Section 6.28 and Attachment C of this RFP) and the volume, in gallons, of water purged before sampling; the name, address, and telephone number of the well owner and the site tenant if any private wells are sampled,
3) any and all other field notes recorded during the investigation,
4) field notes must include the daily chronological events. This includes time boring/well was initiated, completed, developed/purged, sampled, static water level measured, triangulation calculations and all pertinent information relevant to the assessment. Field notes must not include a general summary of methods and procedures used during the assessment.
5) results of any field analysis of wastes conducted during onsite treatment,
6) specific location where wastes were disposed or discharged (landfill or thin spread location).

Appendix 5  Reports, Access Agreements, Lien Releases, Ownership and Business Search Documentation

Include copies of the following:

1) the RLS surveyor’s report and Full Site Survey. Full Site Survey is only required in the LSA EC logging addendum report.
2) the Kansas Geological Survey water well search report. Designate wells within 1/4 mile of contaminant plume,
3) Domestic Well Contact Form (if a domestic, lawn & garden, or PWS well is sampled),
4) all signed access agreements (see Section 3.3.8 of this RFP),
5) copy of the wastewater disposal waiver letter from the Bureau of Water,
6) include a copy of the KDHE Water Well Record (form WWC-5) for each monitoring well installed,
7) a table summarizing the current and previous business names and owners, property uses (commercial, industrial, residential) of the facility, and whether fuel was dispensed at the facility by previous owners. Include the dates of ownership and current address(es) for each owner.
8) documentation of property record search used to complete list of previous or current business names, owners and property use must be included.

Appendix 6  Offsite Waste Handling Documentation

Provide documentation of how wastes removed from the site were handled and/or treated, including the authorization for wastewater disposal, waste manifests, invoices, etc.
SECTION 5.0 REIMBURSEMENT

5.1 REIMBURSEMENT GUIDELINES

5.1.1 All Requests for Reimbursement must include the following:

5.1.1.1 Completed Request for Reimbursement forms signed by the O/O or their authorized representative. (Must be original signatures - copies not accepted.) Request for Reimbursement forms must be complete, clean and accurate.

5.1.1.2 If the Request for Reimbursement is being submitted by Vendor as “Attorney in Fact” for O/O, then the following must occur:

5.1.1.2.1 A copy of the “Attorney in Fact” agreement must either be on file with KDHE or included with the request.

5.1.1.2.2 The Request for Reimbursement form must be marked to indicate it is being submitted as “Attorney in Fact” for O/O.

5.1.1.2.3 The Request for Reimbursement form must show the correct remittance address.

5.1.1.3 Vendor invoices submitted for reimbursement must use the same line item format as the Project Bid Proposal Sheets.

5.1.2 Total reimbursement will not exceed the lesser of the actual costs incurred for each line item or the total cost for each line item in the Project Bid Proposal Sheet unit pricing.

5.1.3 The Vendor will only receive payment for work conducted and accepted in accordance with the specifications outlined in this document.

5.1.4 Vendor shall obtain a minimum of three written bids for equipment, materials, and subcontracted services not included in the approved bid that are more than $500.00 per item, unless otherwise specified by KDHE. A cost-plus surcharge will be applied to the cost of the item.

Please refer to the most recent version of the Kansas Petroleum Storage Tank Release Trust Fund Policy and Procedure Manual for additional information associated with reimbursement and cost-plus surcharge.
5.1.5 The Vendor may submit invoices for reimbursement at the following stages of project completion:

<table>
<thead>
<tr>
<th>Completion</th>
<th>Invoice Amt.</th>
<th>Pay Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Plan &amp; Drilling</td>
<td>100%</td>
<td>90% of the approved invoiced amount. Work must be completed.</td>
</tr>
<tr>
<td>Sampling, Analytical, Hydrologic Testing</td>
<td>100%</td>
<td>90% of the approved invoiced amount. Work must be completed.</td>
</tr>
<tr>
<td>Final Report</td>
<td>100%</td>
<td>90% of the approved invoiced amount. Work must be completed and the report received by KDHE. Balance of the contract value upon approval of the report.</td>
</tr>
</tbody>
</table>

5.1.6 KDHE will review the Final Report within sixty (60) calendar days and submit written comment to the Vendor, or if approved, the remaining 10% will be released when invoiced. If KDHE fails to review the Final Report and approve it or provide written comment within the sixty (60) calendar day time period, the remaining 10% will be released when invoiced.

5.1.7 Written notification of the Final Report approval will include notice of KDHE’s decision on whether or not the monitoring phase will be implemented. If the monitoring phase is implemented, the Vendor may submit invoices for reimbursement following submittal of the report for each monitoring event. Payment will be at 100% of the approved invoiced amount.

5.1.8 All reimbursement requests must be submitted no later than 60 days after the completion of the project.

5.2 PENALTY AND DISQUALIFICATION

Deficiencies related to Vendor performance may result in denial of reimbursement and/or disqualification of the Vendor from bidding on future projects until the Vendor is reinstated.

Significant deficiencies in Vendor performance on a specific project, as determined by KDHE, will disqualify the Vendor from further work on the project. In these cases, the Owner/Operator will be obligated to terminate their contract with the disqualified Vendor and contract with a qualified Vendor to complete the approved scope of work. Failure to do so will place the Owner/Operator in violation of the terms of their Consent Agreement with KDHE.

Please refer to the Storage Tank Section Policy and Procedure Manual for detailed information concerning penalties, Vendor disqualification, and Vendor reinstatement.
SECTION 6.0 PROPOSAL DEFINITIONS

6.1 ADDENDUM REPORTS
This item shall include all labor and equipment costs to properly complete and submit the Report Addendum. The Limited Site Assessment Addendum Report(s) must follow the original report format outlined in Section 4.4.4 of this document. Limited Kansas Risk Based Corrective Action Addendum report(s) must follow the original report format outlined in the most recent Limited Kansas Risk Based Corrective Action Report Format. The line item rates approved during the bid process cannot be exceeded. All hours will be prorated based on the original bid approval. New line items cannot be added to the addendum cost approval.

6.2 BORING PERMITS
This item shall include the cost charged by the local government entity for drilling or installing a soil boring or monitoring well on city property, city easements, or any other property. Costs for boring permits will not be reimbursed without a valid receipt from the entity issuing the permit.

6.3 DIRECT PUSH EC LOG RIG MOB
Mobilization costs shall be per mile from the official station of the equipment. Mobilization costs shall further include all associated costs with transporting the equipment and operator/crew plus one support vehicle to and from the site. No staff hours or other expenses will be paid for mobilizing to and from the site. Local mobilization (50 miles or less) shall be a lump sum amount.

6.4 DIRECT PUSH EC LOG RIG W/CREW
This item must be bid on a footage basis. If additional footage is required, reimbursement will be on a per foot basis. This item shall include all costs associated with use of the rig, including labor, and all equipment, potholing, waste handling, decontamination, and subsidiary equipment and supplies necessary to advance the electric conductivity probe with direct push equipment and generate electric conductivity logs for the footage indicated on the bid.

6.5 DRILL RIG WITH CREW
This item must be bid on a footage basis. If additional footage is required, reimbursement will be on a per foot basis. This item shall include all costs associated with use of the drilling rig, drilling crew, and all drilling equipment; including labor, completion of soil borings, decontamination, subsidiary equipment and supplies (PID, colorimetric detector tubes, acetate liners, etc.), associated soil sampling, onsite disposal of investigation derived waste, and soil handling for offsite disposal. This must only include the driller and helper(s). Do not include any professional field staff responsible for collecting and conducting field analyses of drilling samples.

If possible, costs for handling and treating drill cuttings generated during the field investigation should be achieved by scarification where the hydrocarbon contaminated soils are spread to a 6” thickness or less across the site and turning until the contamination level, based on field screening methods, falls below the KDHE standards for soil remediation of 100 ppm TPH. Scarification of soils must be conducted at a location away from receptors such as sewer inlets, open boreholes, etc. Scarification of soils on offsite properties require landfarm approval from Bureau of Waste Management. KDHE will not reimburse for costs associated with the landfarm.
The Vendor will properly dispose of wastewater when the Vendor obtains approval from the appropriate authority and/or the KDHE Bureau of Water. All applied methods must comply with local, state, and federal laws. These handling and treatment methods are not approved for LNAPL. No waste water is to be stored onsite.

6.6 **ELECTRICAL CONDUCTIVITY (EC) PROBE METHODS**
This work may include continuous soil sampling and electric conductivity (EC) logging. Continuous samples must be collected using a closed-piston, closed-tube or similar sampling method. An electric conductivity (EC) log will be generated to verify sedimentary descriptions prior to selecting well location, screen depths, and intervals, and to identify depositional units that could pose a problem for the successful operation of the selected remedial technologies. A discrete sample will be taken to confirm the composition of any fine-grained sediment indicated by the EC probe in the saturated zone. The conductivity log will then be compared to the lithologic description generated from the continuous sampling. Any suspected anomaly between the logs must be brought to the attention of the KDHE Project Manager. Information regarding the direct push electric logging is located in Attachment F. EC logs must be provided in Section 4.0, Drilling Logs, of the final report.

6.7 **FIELD GEOLOGIST**
This item shall include the cost for the Field Geologist as defined in Section 1.4.2 of this document. This item shall be bid on an hourly basis and for the number of hours necessary to perform the tasks specified for the complete assessment phase scope of work.

This item must be included on page 1 of Exhibit 2. Costs are submitted for Field Geologist directly associated with onsite drilling activities and separate travel time.

6.8 **FIELD WORK PLAN**
This item shall include all labor and equipment costs to properly complete and submit the Field Work Plan Worksheet with the required maps, photos and all other required information. The Field Work Plan Worksheet is included as Attachment D.

6.9 **FINAL REPORT (ASSESSMENT PHASE)**
This item shall include all labor and equipment costs to properly complete and submit the Final Report. The Final Report requirements and format are included in Section 4.4.4 of this document.

6.10 **FULL SITE SURVEY**
This item shall include all costs associated the site survey as described in Sec.3.3.11

6.11 **LAB METHODS**
This item shall include designation of the EPA methods to be used for laboratory analysis of soil and water samples.

6.12 **LABORATORY NAME**
This item shall include the designation of the KDHE-approved laboratory that will be performing the analyses of water and soil samples.
6.13 **LNAPL SAMPLES**
This item shall include all costs associated with the collection and analysis of the LNAPL sample (i.e. labor, equipment, shipping, etc.). The purpose of the LNAPL sample is to determine the type of petroleum product or mixture of products (kerosene, used motor oil, diesel, weathered/unweathered gasoline, fuel oil, jet fuel, etc.) present, including any not previously known to be present, that could affect selection of an appropriate remediation design and/or technology. Provide the per sample cost for analysis and associated costs; it is expected that at least two complementary analyses will be required to achieve this goal.

6.14 **LSA ADDENDUM REPORTS WITH EC LOGGING AND GEOLOGIC CROSS SECTIONS**
This item shall include all labor and equipment costs to properly complete and submit the LSA Addendum. The LSA Addendum requirements and format are included in Section 4.4.4 of this document. In addition, the following information is required. A copy of all EC logs (include in Section 4), direct push probe logs (include in Section 4), Figure 9 Geologic Cross Section A (Include in Section 3), Figure 10 Geologic Cross Section B (include in Section 3), and a copy of the full site survey (include Section 3).

6.15 **MONITORING MOBILIZATION**
This item shall include the cost for each vehicle necessary to transport staff and equipment to conduct the monitoring. This item will be bid on a daily and/or per mile basis per vehicle and is inclusive of all incidental costs (i.e. maintenance, fuel, insurance, parking, tolls, etc.). Daily use rates shall include local mileage while performing the job duties. Mileage will be reimbursed for mobilization from the official station of the vehicle to and from the job site according to Google® Maps or similar mapping tool. A daily rate and a per mile rate cannot be used on the same day.

6.16 **MONITORING WELLS**
This item shall include the cost to complete permanent monitoring wells which will include the blank well casing and screen, the annular space gravel pack, the annular seal, and grout (see Attachment A). This cost shall be bid on a per foot basis. KDHE will not reimburse for improperly or illegally constructed wells, or wells which cannot be used for long term monitoring at the site (pre-approved temporary monitoring wells are an exception).

6.17 **MUD ROTARY WASTE DISPOSAL**
This item shall include costs for handling and disposing of drilling waste. The method of disposal must be included in the bid documents and approved field work plan. Handling of waste in a manner other than that outlined in the bid documents and approved field work plan will not be reimbursed for unless approved by the KDHE Project Manager. All applied methods must comply with local, state, and federal laws.

6.18 **OFFSITE SOIL WASTE HANDLING AND DISPOSAL**
This item shall include costs for handling and disposing of drill cuttings offsite. The Vendor will supply costs for landfill disposal of waste soils and/or an alternate method of treatment. These methods must be included in the bid documents and the field work plan. Handling of soils in a manner other than that outlined in the bid documents and approved field work plan will not be reimbursed for unless approved by the KDHE Project Manager. All applied methods must comply with local, state, and federal laws.
The Vendor will insure that all arrangements for disposal have been submitted and/or approved prior to mobilizing to the site for drilling activities. The Vendor will insure that no containerized soils/cuttings will remain onsite following drilling activities. These handling and treatment methods are not approved for waste saturated with petroleum products.

6.19 **PER DIEM**
This item shall be a fixed price for one person to cover lodging and expenses. Per Diem will be approved only for each night an employee is required to remain onsite overnight.

6.20 **POTHOLING**
This item shall include all mobilization, equipment, materials, and labor costs associated with confirming that proposed locations of subsurface investigation, well installation, or remedial action will not damage utilities, product lines, storage tanks, cathodic protection or other subsurface structures. The vendor will not be reimbursed for drilling through the void of the pothole.

Although not required, KDHE encourages Vendors to perform potholing prior to subsurface investigative, well installation or remedial work. This item shall be cost-plus and a receipt must be provided for reimbursement. The vendor must include the cost-plus percentage on the EXHIBIT 2, Project Bid Proposal Sheet. Please refer to the current Kansas Petroleum Storage Tank Release Trust Fund Policy and Procedure Manual for surcharge percentages. The vendor may bid a lower cost-plus percentage. Bids may be rejected if a lower or applicable surcharge is not represented throughout the EXHIBIT 2, Project Bid Proposal Sheet. Cost for potholing completed by the vendor will be included with drill rig with crew or included in staff time on the EXHIBIT 2, Project Bid Proposal Sheet.

If utilities, product lines, storage tanks, cathodic protection or other subsurface structures are damaged or destroyed during field work, the Vendor will be solely liable for repair of damage, injury, loss of business, etc., including all related costs, that may result from the damage regardless of whether potholing was performed or not.

6.21 **PRIVATE UTILITY LOCATE**
This line item shall include all mobilization, equipment, materials, and labor costs associated with conducting a private utility locate prior to performing subsurface investigation, well installation, or remedial action.

Although not required, KDHE encourages Vendors to perform private utility locates for each on-site and off-site location where intrusive subsurface investigation, well installation, or remedial action will be performed. This item shall be cost-plus and a receipt must be provided for reimbursement. The vendor must include the cost-plus percentage on the EXHIBIT 2, Project Bid Proposal Sheet. Please refer to the current Kansas Petroleum Storage Tank Release Trust Fund Policy and Procedure Manual for surcharge percentages. The vendor may bid a lower cost-plus percentage. Bids may be rejected if a lower or applicable surcharge is not represented throughout the EXHIBIT 2, Project Bid Proposal Sheet.

If utilities, product lines, storage tanks, cathodic protection or other subsurface structures are damaged or destroyed during field work, the Vendor will be solely liable for repair of damage, injury, loss of business, etc., including all related costs, that may result from the damage regardless of whether a private utility locate was performed or not.
6.22 **PROPERTY ACCESS**
This item shall include the costs related to staff time needed to obtain the necessary access agreements for onsite and offsite properties. Provide the title of the individual who will perform the task. This item shall be bid on an hourly basis. This item must be included on page 1 of Exhibit 2.

6.23 **PROPERTY RESTORATION (WELL PLUGGING)**
This item shall include all staff time and equipment to restore the property to its current use. Includes, but not limited to, concrete, asphalt, rock, soil, grass seed, sod, etc.

6.24 **QUARTERLY SAMPLING REPORT**
This item shall include all labor and equipment costs to properly complete and submit each Quarterly Sampling Report. The Quarterly Sampling Report requirements and format are located at [http://www.kdheks.gov/tanks/rfp/index.html](http://www.kdheks.gov/tanks/rfp/index.html). For purposes of this proposal, assume that all Groundwater Isoconcentration maps required for the assessment phase will be required at each monitoring event.

6.25 **RIG MOBILIZATION**
Mobilization costs shall be per mile from the official station of the equipment. Mobilization costs shall further include all associated costs with transporting the equipment and operator/crew plus one support vehicle to and from the site. No staff hours or other expenses will be paid for mobilizing to and from the sites. Local mobilization (50 miles or less) shall be a lump sum amount.

6.26 **SAMPLING TECHNICIAN**
This item shall include the cost for the Sampling Technician as defined in Section 1.4.8 of this document. This item shall be bid on an hourly basis and for the total number of hours necessary to sample and measure the wells specified for all four events in the monitoring phase scope of work. Staff travel time will be entered as a separate line item.

6.27 **SOIL BORING PLUGGING**
This item shall include all costs for labor, equipment and supplies to plug all soil borings in accordance with KDHE regulations and guidelines. This item must be bid on a per foot basis based on the boring diameter of the sampling equipment.

6.28 **SOIL SAMPLES**
This item shall include all costs associated with the collection and analysis of samples (i.e. labor, equipment, shipping, etc.). All samples shall be analyzed in accordance with the criteria provided in this document for the constituents outlined in Exhibit 2. Provide the per sample cost for collection and analysis for each constituent indicated.

6.29 **SATURATED ZONE (Permeability, Grain Size)**
This item shall include the cost to conduct a minimum of two permeability tests per site using ASTM Method D 2434 or D 5084. Each test must be performed on a soil sample collected from the saturated zone and be collected from different intervals. The saturated zone will not be based on static water level. Please contact the KDHE project manager if the saturated zone cannot be determined or if the site has shallow bedrock or sand. A saturated zone sample will not be collected when mud rotary is required for well installation.
If the appropriate test is not conducted, reimbursement for the incorrect test will be denied.

Laboratories which perform analysis using ASTM methods must be accredited for the specific method(s) by the Army Corp of Engineers or an approved equivalent accreditation entity.

6.30 **STAFF TRAVEL TIME**
This item will include all costs associated with the time needed for staff to mobilize to and from a site for the scheduled scope of work. This item will be bid on a per hour basis.

6.31 **SUPPORT VEHICLE (ASSESSMENT PHASE)**
This item shall include the cost for all vehicles necessary to transport staff, other than the drill crew, to conduct the investigation. This item will be bid on a daily and/or per mile basis per vehicle and is inclusive of all incidental costs (i.e. maintenance, fuel, insurance, parking, tolls, etc.). Daily use rates shall include local mileage while performing the job duties. Mileage will be reimbursed for mobilization from the official station of the vehicle to and from the job site according to Google® Maps or similar mapping tool. A daily rate and a per mile rate cannot be used on the same day.

6.32 **SURVEYING**
This item shall include the cost for surveying by a Registered Land Surveyor. This item shall be cost-plus and a receipt must be provided for reimbursement. The vendor must include the cost-plus percentage on the EXHIBIT 2, Project Bid Proposal Sheet. Please refer to the current Kansas Petroleum Storage Tank Release Trust Fund Policy and Procedure Manual for surcharge percentages. The vendor may bid a lower cost-plus percentage. Bids may be rejected if a lower or applicable surcharge is not represented throughout the EXHIBIT 2, Project Bid Proposal Sheet.

6.33 **UNSATURATED ZONE (Total Organic Carbon, Water Content, Bulk Density)**
Total organic carbon will be determined using the ASTM Method D 2974. Water content will be determined ASTM Method D 2216. Bulk density will be determined using ASTM Method D 2937.

Laboratories which perform analysis using ASTM methods must be accredited for the specific method(s) by the Army Corp of Engineers or an approved equivalent accreditation entity.

Soil samples collected to determine the physical properties must be collected from a zone that is similar to the zone of probable petroleum migration but located in an area that has not been impacted by any released substance. Each test must be performed on a soil sample collected from the unsaturated zone and be collected from different intervals.

6.34 **WATER SAMPLE ANALYSIS**
This cost shall be bid on a per well basis. This cost shall include electronic water level indicator, interface probe, no purge samplers, submersible pumps, peristaltic pumps, bladder pumps, tubing, bailers, and filters as necessary. Costs also include shipping, lab costs, ice, coolers, sample containers, etc. All samples shall be analyzed in accordance with the criteria provided in this document for the constituents outlined in Exhibit 2. This item must be bid on a per sample basis. If additional samples are required, reimbursement will be on a per sample basis.
6.35 **WELL COMPLETION**
This item shall include the cost for a monitoring well pad and flush or stick up protective locking cover. All monitoring wells must be completed in accordance with regulations and KDHE guidelines (see Attachment A) and a black locking tag must be attached prior to demobilization.

6.36 **WELL DEVELOPMENT**
Well development costs shall be per well and must include all labor, necessary equipment to complete the task, and disposal of development water. All wells must be properly developed within 24 hours after completion. Well development shall involve removal of at least the amount of any water added during the drilling and installation activities plus five times the well volume. The well volume is considered to be, for development purposes, the volume of standing water within the well casing and the volume within the filter pack with an assumed porosity of 30%. Well development requires surging or agitating water within the screened interval to affect development of the filter pack and any formation skin by pumping rapidly and intermittently at various depths within the screened interval using a downhole pump, use of a surge block or bailer, and/or air-lift pumping; other development methods may be approved by KDHE on a site-specific basis. See Attachment C for calculation of well volume.

6.37 **WELLHEAD REMOVAL (WELL PLUGGING)**
This item shall include all necessary labor and equipment to remove the wellhead, pad, and all related materials down to the required depth of three feet, soil and debris handling, restoration, and completion of WWC-5P forms.

6.38 **WELL PLUGGING**
Well plugging costs shall be per foot and must include labor and all plugging materials and equipment necessary to permanently plug the well.

6.39 **WELL PLUGGING REPORT**
This item shall include all labor and equipment costs to properly complete and submit the Well Plugging Report. The Well Plugging Report must include a summary of field activities, color photographs of all plugged wells, map, field notes, and copies of WWC-5P forms.
ATTACHMENT A

KDHE MONITORING WELL DESIGN
STANDARD MONITORING WELL DESIGN

WELL HEAD PROTECTOR
Steel or PVC cover with water tight cap, set in the concrete pad, and equipped with a locking device to prevent tampering. Cover should provide adequate space to allow access to the well.

SANITARY WELL SEAL
Top of casing shall be sealed by installing a waterproof sanitary well seal when the well is completed.

CONCRETE PAD
Should be a minimum of 2' x 2' x 6" thick to secure the protective cover, prevent pooling of water and vegetative growth around the well, and allow for placement of a surveyor pin.

GROUT MATERIAL & MINIMUM GROUT INTERVAL
Seal the well annulus with approved impervious grout material from ground surface to at least 20 feet or to at least 5 feet into the first clay or shale layer if present, whichever is greater. The diameter of the borehole shall be at least 3-in greater than the maximum outside diameter of the casing. Water from two or more separate aquifers shall be separated by sealing the annulus between aquifers with grout. If groundwater is encountered less than the minimum grouting requirement, it may be modified to meet local conditions (K.A.R. 28-30-2(p) & 28-30-6(b) & (c)). If used, dry sodium bentonite products should be hydrated in accordance with manufacturer specifications.

SCREEN SEAL
A 2' layer of bentonite chips or pellets should be placed on the gravel pack to prevent infiltration of grout into the gravel pack.

GRAVEL PACK
The gravel pack should be sized to prevent infiltration of fines into the well. The source of the gravel pack material should be carefully determined to eliminate the possibility of contamination of the well.

WELL CASING
Well casing shall terminate one foot or more above ground surface (28-30-6(f)), unless located in high traffic area according to 28-30-6(s), then follow requirements. The following well casings are acceptable for monitoring well use: 2" PVC Schedule 40 or thicker, 4" PVC SDR 26 or thicker, and 5" PVC SDR 26 or thicker. Steel casing must be 10 gauge or thicker (K.A.R. 28-30-6(f)(4)).

All casing materials must be connected without use of solvents, glues, or materials which would introduce contamination into the well. Some other casings are approved for well construction but are not as commonly used. All casing materials must be compatible with groundwater conditions.

SCREEN
Wells must be equipped with manufactured well screen which provides adequate communication with the aquifer to provide a representative sample without allowing fines to enter the well.

GROUNDWATER ZONE PROTECTION
Unless targeted by the well, each groundwater-producing zone with known or suspected natural or manmade pollution shall be cased and grouted according to 28-30-6(b) during construction to prevent movement upward or downward to other zones.

CONTRACTOR LICENSING
All monitoring wells must be constructed by a licensed water well contractor as specified in Article 12 and Article 30.

Statutes in Article 12 and regulations in Article 30 (K.A.R. 28-30-2 et seq.), can be viewed at the KDHE/BOW/Geology & Well Technology Section’s Water Well Program website at: http://www.kdheks.gov/waterwell/index.html.

KDHE 2/2018
K.A.R. 28-30-2 (p) Grout
Grout means bentonite clay grout, cement grout, neat cement grout, or other material approved by KDHE used to create a permanent impervious, watertight bond between the casing and the undisturbed formation surrounding the casing or between two or more strings of casing.

(1) "Bentonite clay grout" means a mixture of water and either commercial grouting or plugging sodium bentonite clay, including sodium bentonite clay manufactured under the trade name of "volclay grout," or an equivalent as approved by KDHE according to the following:
   (A) The mixture shall be as per the manufacturer's recommendations to achieve a weight of at least 9.4 pounds per gallon of mix. Weighing agents may be added as per the manufacturer's recommendations.
   (B) Sodium bentonite pellets, tablets or granular sodium bentonite may also be used if these additives or materials meet the specifications listed in paragraph (p)(1) above.
   (C) Sodium bentonite products that are designed for drilling purposes or contain organic polymers shall not be used.

(2) "Cement grout" means a mixture of one 94-pound bag of portland cement, an equal volume of sand having a diameter no larger than two millimeters, and five to six gallons of clean water.

(3) "Neat cement grout" means a mixture consisting of one 94-pound bag of portland cement and five to six gallons of clean water.

K.A.R. 28-30-6 (b) Grouting Requirements
(1) Constructed and reconstructed wells shall be sealed by grouting the annulus between the casing and the boring from ground level to at least 20 feet or to at least five feet into the first clay or shale layer if one is present, whichever is greater. If a pitless well adapter or unit is being installed, the grouting shall start below the point at which the pitless well adapter or unit attaches to the casing and shall continue at least 20 feet below this point or to at least five feet into the first clay or shale layer, whichever is greater.

(2) The diameter of the drilled boring shall be at least three inches greater than the maximum outside diameter of the casing.

(3) Water from two or more separate aquifers shall be separated from each other in the boring by sealing the annulus between the aquifers with grout.

K.A.R. 28-30-6 (c) Grouting Requirements – Shallow Groundwater
If groundwater is encountered at a depth less than the minimum grouting requirement, the grouting requirement may be modified by KDHE to meet local conditions.

K.A.R. 28-30-6(s) At-Grade Surface Completion
A monitoring well may be completed at-grade (or flush-mount) without requesting a waiver if it is to be located in a heavily-trafficked area. Otherwise, submission of a waiver request and preapproval from KDHE/BOW is required. Requirements of 28-30-6(s)(1)-(2) must be met for all flush-mount well completions. Refer to the documents Flush-Mount Well Construction Detail and Procedure for Requesting a Waiver to Allow Installation of a Flush-Mount Monitoring Well (WWP-5).

K.A.R. 28-30-7 Plugging Requirements
Monitoring wells must be plugged in accordance with applicable requirements in 28-30-7(a), (b), and (c), unless other regulations exist locally. Plugging and associated regulations for wells in the Equus Beds Groundwater Management District #2 are included in Article 30 as 28-30-200 through 28-30-207. Refer to the document Procedure for Plugging a Groundwater Monitoring Well (WWP-10).

ADDITIONAL REQUIREMENTS
Additional requirements for monitoring well construction and plugging established in KDHE environmental programs must be followed, where appropriate. Check with the KDHE project manager for this information.

Regulations in Article 30 (K.A.R. 28-30-2 through 28-30-207) and documents referenced above can be found on the KDHE/BOW/Geology & Well Technology Section’s Water Well Program website at: http://www.kdheks.gov/waterwell/index.html.
KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT

FLUSH-MOUNT WELL CONSTRUCTION DETAIL

(Not to Scale)

<table>
<thead>
<tr>
<th>Casing Diameter</th>
<th>2” or less</th>
<th>4”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vault Diameter</td>
<td>6” min</td>
<td>8” min</td>
</tr>
<tr>
<td>Concrete Pad</td>
<td>24” x 24”</td>
<td>24” x 24”</td>
</tr>
</tbody>
</table>
MONITORING WELL DESIGN ADDITIONAL INSTRUCTIONS

At-Grade or Flush-Mount Monitoring Well Surface Completion:

K.A.R. 28-30-6(s) requires each monitoring well to be an above-grade surface completion, unless the monitoring well is to be located in a roadway, sidewalk, driveway, parking lot, or other heavily trafficked area that requires an at-grade surface completion. The following requirements shall be met for each at-grade surface completion:

1. The location, latitude and longitude coordinates, and a unique well number shall be shown for each monitoring well on a scaled map. The scaled map and coordinates for each well shall be submitted to the department with the water well record (WWC-5 Form) provided by the department; and

2. The construction method for each monitoring well shall meet the requirements of the department’s procedure document entitled “Flush-Mount Well Construction Detail.”

If the location conditions of K.A.R. 28-30-6(s) are not met, then a waiver for variance must be requested. The procedures for requesting a waiver of this regulation are outlined in Procedure # WWP-5 and include the following:

1. Submit the waiver request in writing at least 30-days in advance to Pamela Chaffee at address below.

2. Obtain pre-approval from the local city, county, groundwater management district and/or local environmental protection program where the waiver is requested. Provide documentation with the request.

3. The request for variance must contain the following information:
   a. Name and license number of the Kansas water well contractor installing the well(s);
   b. Facility or site name, street address, city and county;
   c. Well location description(s) defining the 2.5-acre quarter fraction, section, township, and range;
   d. Well owner’s name and address;
   e. Detailed explanation of why a waiver is needed;
   f. Drawing or map showing the proposed well location(s) and pertinent surrounding features;
   g. Number of wells to be covered by the waiver request;
   h. Descriptions, specifications, and/or graphic displays of the watertight manhole cover, well vault, and watertight lockable well cap to be used in the well’s completion;
   i. Graphic display of the proposed well, such as the attached example, with concrete encasing and sloping away from the manhole cover;
   j. A statement that at least 3-inches of concrete shall be installed below the bottom of the well vault skirt(s) and approved grout shall extend to the top of the bentonite seal – two to three feet above the well’s screened interval.

4. Wait for approval of the waiver request before completing the monitoring well(s).

5. If granted, the location, latitude and longitude coordinates and associated horizontal datum, and a unique well number for each flush-mount monitoring well shall be shown on a scaled map and submitted to KDHE with the WWC-5 Form for the first well authorized by the waiver.

A waiver of variance applies only to the wells and information contained in the written request. A verbal request for a waiver on additional wells in the same area or site may be approved by the KDHE-BOW-GWTS.

Monitoring Well Grouting Requirements:

K.A.R. 28-30-6(b) requires that constructed or reconstructed wells be sealed by grouting the annular space between the casing and the well bore from ground level (or from below a pitless well adaptor or unit) to at least 20 feet or to at least five feet into the first clay or shale layer, whichever is greater. K.A.R. 28-30-6(c) specifies that if groundwater is encountered at a depth less than the minimum grouting requirement, the grouting requirement may be modified to meet local conditions if approved by the department.

If modifications to the grouting requirements are necessary solely because of shallow groundwater, which is the target of the well, a waiver of the regulations is not needed; however, the grouting modifications must be indicated accordingly on the WWC-5 Form. Where grouting modifications are required for reasons other than shallow groundwater, a waiver for variance must be obtained following the procedure outlined in Procedure # WWP-3.

Submit requests for variance waivers and direct any questions on well design regulations to:

Pamela Chaffee
Kansas Department of Health & Environment
Bureau of Water – Geology & Well Technology Section
1000 S.W. Jackson Street, Suite #420
Topeka, Kansas 66612-1367
Phone: (785) 296-3565
ATTACHMENT B

MONITORING WELL & SOIL BORING PLUGGING CRITERIA
K.A.R. 28-30-7
ARTICLE 30--WATER WELL CONTRACTOR’S LICENSE;
WATER WELL CONSTRUCTION AND ABANDONMENT

This article regulates the construction, reconstruction, treatment and plugging of water wells and sets forth procedures for the licensing of water well contractors as required by K.S.A. 82a-1201 to 82a-1215 and amendments thereto.

All wells will be plugged and abandoned in accordance with Kansas Administrative Regulation (K.A.R.) 28-30-7

WELL PLUGGING/ABANDONMENT REQUIREMENTS

The following requirements supplement section K.A.R. 28-30-7 of Article 30.

A) The following requirements will be mandatory for plugging monitoring wells that have 20 feet or greater of grout (including the bentonite plug):

1) The well head, concrete pad and protective cover (if above grade completion) must be removed.
2) The well must be filled with an approved plugging material. After the casing or casing void has been filled with an approved plugging material, the casing shall be cut off to a level three (3) feet below ground surface. The remaining excavation may then be backfilled with native soils.
3) The property will be restored as near to the original condition subsequent to plugging.

B) The following requirements will be mandatory for plugging monitoring wells that have less than 20 feet of grout (including the bentonite plug) and was given an approved waiver request for the original installation of the monitoring well by the Bureau of Water, Kansas Department of Health and Environment:

1) The well head, concrete pad and protective cover (if above grade completion) must be removed.
2) The well must be filled with an approved plugging material. After the casing or casing void has been filled with an approved plugging material, the casing shall be cut off to a level three (3) feet below ground surface. The remaining excavation may then be backfilled with native soils.
3) The property will be restored as near to the original condition subsequent to plugging.

C) For wells greater than 50’ total depth, the entire hole shall be plugged with an approved grouting material from bottom of the hole, up to within three feet of the ground surface, using a grout tremie pipe (grout pipe) or similar method.

Refer to K.A.R. 28-30-2(p) and (q) for definitions of grout, grout tremie pipe and grout pipe.
ATTACHMENT C

BOREHOLE STORAGE VOLUME CALCULATIONS
PROCEDURE FOR CALCULATING WELL BORE STORAGE VOLUME

The following well specifications are needed to accurately determine the Well Bore Storage Volume (WBSV) and ultimately, the volume of water to be purged from the well during well development.

Total Depth (TD) of well: ______________________________________________________

Depth to Water (DTW) in the well: _____________________________________________

Nominal Diameter of Casing/Screen: ___________________________________________

Diameter of Borehole: _________________________________________________________

Depth to Top of Filter Pack: _________________________________________________

Pore Volume of Filter Pack: _________________________________________________
(assume a porosity of 25% if unknown)

Calculate the WBSV using the following mathematical formula:

WBSV (gallons) = π(r₁)²h₁ + 0.25 (π(r₂)²h₂ - π(r₁)²h₂)

Where:

π (pi) = 3.1416
r₁ = radius of well casing/screen
h₁ = TD minus DTW
r₂ = radius of borehole
h₂ = TD minus Depth to Top of Filter Pack
0.25 = assumed porosity of Filter Pack
r₁, h₁, r₂, h₂ units = inches

Example:

TD = 50 feet
DTW = 30 feet
Nominal Diameter of Casing/Screen = 2 inches
Diameter of Borehole = 8 inches Depth to Top of Filter Pack = 35 feet
Porosity (assumed) = 25%

WBSV (gallons) = π(r₁)²h₁ + 0.25 (π(r₂)²h₂ - π(r₁)²h₂)

WBSV = 3.1416 (1")²(240") + .025[3.1416(4")²(180") - 3.1416(1")²(180")]
= 753.984 + .025[ 9047.808 -565.488 ]
= 753.984 + .025[ 8482.32 ] = 2874.564 in³ / 1728 in³/ft³
= 1.644 ft³ x 7.4809 gallons/ft³ = 12.45 gallons

Where: ft³ = 1728 in³ and ft = 7.4809 gallons
VOLUME OF WATER IN CASING OR HOLE

<table>
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<th>Diameter of Casing or Hole (in)</th>
<th>Gallons per foot of Depth</th>
<th>Cubic Feet per Foot of Depth</th>
<th>Liters per Meter of Depth</th>
<th>Cubic Meters per Meter of Depth</th>
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</tr>
</tbody>
</table>

1 Gallon = 3.785 Liters
1 Meter = 3.281 Feet
1 Gallon Water Weighs 8.33 lbs. = 3.785 Kilograms
1 Liter Water Weighs 1 Kilogram = 2.205 lbs.
1 Gallon per foot of depth = 12.419 liters per foot of depth
1 Gallon per meter of depth = 12.419 x 10^{-3} cubic meters per meter of depth
ATTACHMENT D

FIELD WORK PLAN WORKSHEET
**PETROLEUM STORAGE TANK RELEASE TRUST FUND**  
**LIMITED SITE ASSESSMENT FIELD WORK PLAN WORKSHEET**

<table>
<thead>
<tr>
<th>KDHE Site Name:</th>
<th>KDHE Project Code:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vendor:</td>
<td>Vendor Contact:</td>
</tr>
</tbody>
</table>

**Instructions:** This form must be completed by providing the information requested below. Do not include any attachments with this worksheet other than those described herein.

### I. Site Information

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<thead>
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<th>Kansas</th>
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</thead>
<tbody>
<tr>
<td>(Street)</td>
<td>(City)</td>
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</table>

### II. Investigation Information

Check the general methodologies to be used:
- [ ] Soil Borings
- [ ] Monitoring Wells

List the requested information where indicated:

#### 1) Drilling

- Complete both columns. List primary equipment under column "A", under column "B", list drilling equipment to be used if auger refusal is encountered. Additional drill rigs may be included on a separate page. Indicate if the rig will only be used for soil borings.

<table>
<thead>
<tr>
<th>Drill Rig</th>
<th>Brand/Model</th>
<th>Torque Rating</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Drill String</th>
<th>Type (Augers, etc.)</th>
<th>O.D. / I.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Borehole Size
- Sample Collection Equipment & Length
- Drilling Sample Frequency
- Soil sample intervals for constituent analysis (refer to Section 3.3.7 of the LSA RFP)

#### 2) Field Screening Instrument

- Device (Brand / Type / Spec)
- Calibration Standard / Frequency

#### 3) Monitoring Well Development

- Method (bailer, pump, etc.)
- Minimum well volume to be withdrawn (Drilling Scenario "A")
- Minimum well volume to be withdrawn (Drilling Scenario "B")

#### 4) Hydrogeologic Testing Methods (list test method & number of tests)

<table>
<thead>
<tr>
<th>Unsaturated Zone</th>
<th>Specific Gravity</th>
<th>Number of tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Bulk Density</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic Matter/Carbon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Content (gravimetric)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Saturated Zone</th>
<th>Permeability</th>
<th>Number of tests</th>
</tr>
</thead>
</table>

(continued on back)
5) **Laboratory Analytical**

<table>
<thead>
<tr>
<th>Soil Samples</th>
<th>Collection Equipment</th>
<th>Analytical Methods</th>
<th>Laboratory to Conduct Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Samples</td>
<td>Collection Equipment</td>
<td>Analytical Methods</td>
<td></td>
</tr>
</tbody>
</table>

6) **Waste Handling Procedures** (Briefly describe how soil and water waste will be handled, treated, or disposed of.)

<table>
<thead>
<tr>
<th>Soil</th>
<th>Water</th>
</tr>
</thead>
</table>

7) **Decontamination** (Briefly describe decontamination equipment, methods and procedures to be employed.)

### III. Site Maps and Photos

**Note:** All maps and aerial photos must include a scale, north arrow and legend.

1) Attach a copy of a U.S.G.S. 7.5 minute quadrangle, scale 1:24,000, which depicts the general site location and the 1 mile radius area surrounding the site. The site must be highlighted or outlined for delineation.

2) Prepare and submit with this worksheet **two site maps**. The first site map will depict the site including a minimum 500’ radius from the release with an approximate scale of 1’=100’. The second site map will be a detailed site map with a scale of 1’ = 50’. These maps must be representative of current property conditions at the time the workplan was completed. If an aerial photo is used along with the CAD drawing, it must be of good visual quality and represent current property conditions. Both maps must contain the following information:

   A. The general use of surrounding properties: i.e., residential, industrial, business (indicate what type - fast food, service stations, etc.).
   B. All property owners' names.
   C. Property boundaries, buildings, driveways, other fixed objects (trees, fences, steep inclines, etc.), and street names. Identify all buildings.
   D. Tanks, lines, and pump islands, currently or formerly located at the site.
   E. General locations and depths/heights of all utilities/overhead lines on and adjacent to the site from visual survey of site.
   F. Proposed boring and monitoring well locations as listed on the SSI sheet. Borings and wells must be labeled and numbered. Include existing wells within 500’ from the source. All wells should be designated in accordance with previous reports if available.
   G. Accessible easements within the specified area.
   H. Arrow depicting groundwater flow direction.
   I. Site name and KDHE Project Code.
   J. Borings used for the collection of hydrologic samples should be clearly indicated.

3) Include the most recent aerial photo available. The aerial photo will depict the site including a minimum 500’ radius from the release with an approximate scale of 1’=100’. The aerial photo must be an original print, a high quality color copy of an original print, or a blue line. Prominent features (buildings, storage tanks, pump islands, existing wells, etc.) should be denoted on the aerial photograph.

4) Include current photographs as stated in Section 4.2.1 of the LSA RFP.

### IV. Field Personnel / Health and Safety Plan

List below the consultant's personnel and any subcontracting firms that will be involved in the investigation. Indicate each individual's name and position title from section 1.4 of the LSA RFP Rev. 14 (attach an additional sheet if necessary). If resumes documenting education, experience, and safety training certification have not been provided with the original bid package for all those listed, submit this information with this worksheet.

<table>
<thead>
<tr>
<th>Name</th>
<th>Position / Title</th>
<th>Name</th>
<th>Position / Title</th>
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</table>

Indicate whether a Health and Safety Plan has been prepared for this scope of work (must be available during field work):

[ ] Yes  [ ] No

Site visit conducted by:  Work plan preparation completed by:
ATTACHMENT E

OWNER/OPERATOR STANDARD CONTRACT
This **CONTRACT** is entered into between __________________________ hereinafter referred to as the Owner/Operator; and __________________________ hereinafter referred to as the Vendor.

**WHEREAS**, the Owner/Operator is in need of Storage Tank consulting and testing services at KDHE project name______________________________, KDHE project code _____-____-_____, site address____________________________________________________, the Owner/Operator has requested bids from qualified firms to provide said services, and the Vendor is qualified to provide the required services, the Owner/Operator and Vendor agree as follows:

1. The Vendor shall perform all services called for under the Request for Proposal (RFP) in accordance with the specifications called for in said RFP.
2. The Owner/Operator shall compensate the Vendor for its services under the terms and conditions of said RFP in the amount of $______________, with payment to be made upon successful completion of the services required by the RFP which is incorporated herein.
3. It is expressly agreed that the terms of each and every provision in this Contract shall prevail and control over the terms of any other conflicting provision in any other document relating to the subject matter of this Contract or to which this Contract is attached.
4. This Contract shall be subject to, governed by, and construed according to the laws of the State of Kansas.
5. The Vendor shall comply with the Kansas Act Against Discrimination (K.S.A. 44-1001 et seq.) and the Kansas Age Discrimination in Employment Act (K.S.A. 44-1111 et seq.) and shall not discriminate against any person who performs work pursuant to this Contract, because of race, religion, color, sex, physical handicap unrelated to such person’s ability to engage in this work, national origin or ancestry, or age.
6. This Contract shall not be considered accepted, approved or otherwise effective until the Owner/Operator receives the required insurance certificates.
7. By signing this Contract, the respective representatives of the Owner/Operator and Vendor hereby represent that they are duly authorized to execute this Contract on behalf of the party they represent and that their principal agrees to be bound by the provisions herein.
8. The Owner/Operator will not be responsible for, nor indemnify a Vendor for, any federal, state or local taxes that may be imposed or levied upon the subject matter of this Contract.

____________________________  ______________________________
Owner/Operator                   Date

____________________________  ______________________________
Vendor                          Date
ATTACHMENT F

DIRECT PUSH ADVANCED SITE CHARACTERIZATION AND
SOIL SAMPLING
DIRECT PUSH ADVANCED SITE CHARACTERIZATION AND SOIL SAMPLING

This attachment outlines the recommended procedure for conducting electrical conductivity logging and soil sampling using direct push methods to advance the probe into the subsurface soils. This procedure should be used in conjunction with conventional drilling methods on underground storage tank Remedial Design Plans performed for KDHE where alluvial deposits are anticipated.

GENERAL

The contractor must have available a Geoprobe, Earthprobe, or similar direct-push vehicle capable of collecting continuous soil cores or discrete soil samples to the depth indicated in the approved Site Work Plan. Soil conductivity logs will be accomplished using a direct-push EC Probe. The operator should be a licensed water well driller in the State of Kansas and personnel should be OSHA certified in accordance with OSHA 29 CFR 1910.120.

All drilling and well construction activities are to be performed in accordance and consistent with ASTM Standards D6282-98 (Guide for Direct Push Soil Sampling for Environmental Site Characterizations), D6001 (Guide for Direct-Push Water Sampling for Geoenvironmental Investigations), D5753 (Guide for planning and Conducting Borehole Geophysical Logging) and applicable KDHE requirements and BER Standard Operating Procedures.

The contractor and the Kansas Department of Health and Environment project manager prior to the work will, mutually agree upon, any deviation from these standards necessitated by field conditions and/or other circumstances, in writing.

ELECTRICAL CONDUCTIVITY (EC) PROBE METHODS

Electrical conductivity logging of in-situ soils can be a useful tool to map subsurface lithologic conditions on sites where samples may be difficult to obtain through traditional drilling methods. Obtaining correct lithology and representative samples in formations with heaving sands and saturated soils are imperative. EC logs allow indirect observation of subsurface lithology in a relatively undisturbed state. Environmental remediation system designers can use EC in prevention of setting remedial wells into and below aquitards, which, restrict air injection and recovery well systems. In general, fine-grained sediments exhibit higher electrical conductivities than medium and coarse-grained sediments. EC is an extremely useful tool when properly applied and calibrated with discrete sampling and in conjunction with traditional soil sampling and monitoring wells.

A continuous full depth EC log will be generated for each proposed location. Due to differences in vertical resolution and depths of current penetration, both Wenner and
dipole array logs may be performed on each site in accordance with the approved work plan. Dipole-array probes provide better vertical resolution of lithology. However, the electrical current does not penetrate the formation to as great a horizontal depth as a Wenner Array. It is possible for dipole array probes to not extend beyond the borehole smear zone. Therefore, it is recommended that logs utilizing both arrays be used on a site.

The EC probe shall be configured so that either a Dipole Array or Wenner Array can be selected. Separate probes for each array are acceptable if both are available on-site and can be changed quickly between probes to prevent delays. The EC probe shall be advanced into the soil using a hydraulic direct-push machine with percussive impact. No drilling or open borehole shall be required once surface pavement is penetrated. Probe locations and sample depths will be performed in accordance with the approved work plan.

The probe shall be tapered to allow continuous contact between the soil and the probe electrodes. An electrical current will be sent through the formation between at least two electrical contacts integrated on the probe. The probe will be connected to the real-time data logger with a direct readout screen so that the operator and geologist can graphically see results in the field. The data logger will also save data in spreadsheet compatible format for downloading to a computer. The on-screen readout shall chart the soil electrical conductivity at the depth encountered as well as the penetration speed of the probe. EC readings will be recorded in milli-Siemens per meter (mS/m). Probe shall be advanced at a rate approved by the manufacturer for optimum resolution.

Printouts of the spreadsheet data and graphical EC logs shall be incorporated into the RDR Report under the Boring Log Section. Soil conductivity logs shall be correlated with the conventional drill logs and direct push sampling. EC-log data should be included into cross sections where appropriate.

**LASER-INDUCED FLUORESCENCE**

Laser-induced fluorescence (LIF) is a method for real-time, in situ field screening of residual and non-aqueous phase organic contaminants in undisturbed vadose, capillary fringe, and saturated subsurface soils and groundwater. The technology is intended to provide highly detailed, qualitative to semiquantitative information about the distribution of subsurface contamination that fluoresces, such as petroleum products containing polycyclic aromatic hydrocarbons (PAHs). An ultraviolet light-emitting diode (UV LED) included in this discussion can also detect monoaromatics (MAHs). Hydrophobic dyes that exhibit fluorescent characteristics can be injected into the subsurface ahead of the LIF probe window. These dyes partition into NAPL sources and emit a characteristic fluorescent pattern that is different from the unpartitioned dye, thus allowing for the detection of NAPL bodies. Source: EPA Clu-In; Contaminated Site Clean-up Information; Technologies; Characterization and Monitoring; [https://clu-in.org/characterization/](https://clu-in.org/characterization/)
**MEMBRANE INTERFACE PROBE**

A MIP is a semi-quantitative, field-screening device that can detect volatile organic compounds (VOCs) in soil and sediment. It is used in conjunction with a rig that uses a hydraulic or pneumatic hammer to drive the MIP to the depth of interest to collect samples of vaporized compounds. The probe captures the vapor sample, and a carrier gas transports the sample to the surface for analysis by a variety of field or laboratory methods. Additional sensors may be added to the probe to facilitate soil logging and identify contaminant concentrations. The results produced by a MIP at any location are relative and subject to analytic verification. Source: EPA Clu-In; Contaminated Site Clean-up Information; Technologies; Characterization and Monitoring; [https://clu-in.org/characterization/](https://clu-in.org/characterization/)

**HYDRAULIC PROFILING TOOL**

The hydraulic profiling tool (HPT) is a logging tool that collects data that site investigators can use for characterizing soil hydraulic properties (Exhibit V-26). The HPT measures the pressure produced by the injection of water at a certain rate into the soil as the probe is advanced into the subsurface. The injection pressure and flow rate log are an indicator of formation permeability. In addition to measuring injection pressure, the HPT can measure hydrostatic pressure under no flow conditions. These data can be used to predict static water level, or head pressure in confined aquifers. Software developed specifically for the tool can also estimate hydraulic conductivity from the HPT pressure and flow data (Geoprobe Systems®, 2010). The HPT has an upper limit to the hydraulic conductivity it can characterize (about 0.01 centimeters per second) (Butler, 2015). [https://www.epa.gov/sites/production/files2014-03/documents/esc-ch5.pdf](https://www.epa.gov/sites/production/files2014-03/documents/esc-ch5.pdf)

**CONTINUOUS SAMPLED - DIRECT PUSH PROBES - DUAL TUBE**

Dual tube sampling uses two sets of probe rods to collect continuous soil cores. One set of rods is driven into the ground as an outer casing. These rods receive the driving force from the hammer and provide a sealed hole from which soil samples may be recovered without the threat of cross contamination.

The second, smaller set of rods are placed inside the outer casing. The smaller rods hold a sample liner in place as the outer casing is driven one sampling interval. The small rods are then retracted to retrieve the sample filled liner. A core catcher and liner shall be used on every sample interval to prevent loss of sample.

Continuous sampled, direct push soil probes will be conducted in conjunction with EC logging to confirm site lithology and to collect samples for laboratory analysis. Continuous samplers shall be capable of collecting a minimum 4-foot sample. Sample diameters of at least 1.5 inches are desirable, however, alternate sizes may be used if
approved by the KDHE Project Manager. A clear, contaminant-resistant liner shall be used within the sample tube to hold core samples until opened for logging.

Soil Probes are to be continuously sampled per the approved work plan. If the geologist and/or the KDHE project manager determine that; continuous sampling cannot not be performed in onsite, saturated soils, discrete samples may be taken to confirm lithology.

**DISCRETE (CLOSED PISTON) SAMPLING**

Closed piston soil sampling does not replace dual tube soil sampling, but may be used in difficult or saturated conditions, heaving or flowing sands and expanding clays. A sacrificial drive tip is used below a center rod containing the core sample liner. The sampler is driven to the desired sample depth, the drive string is retracted to dislodge the drive point, and the sampler is driven one sample interval. A basket retainer may be used in the drive tip to retain the sample. The drill string is then pulled to the surface.

Following Completion of the EC probe(s), the KDHE project manager and/or site geologist will determine elevations for discrete sampling using a closed piston-type sampler, if necessary. Depths of discrete samples will be based upon other site borings and prior EC logging.

**PROBE HOLE PLUGGING**

All soil probes shall be properly grouted. All waste materials shall be disposed of in accordance with local, state and federal regulations.

**SAFETY**

This document does not purport to address any safety concerns associated with its use. It is the responsibility of the Vendor to establish appropriate safety and health practices and determine the applicability of regulatory requirements prior to use.
EXHIBIT 1

SITE SPECIFIC INFORMATION
EXHIBIT 2

PROJECT BID PROPOSAL SHEETS