

PETROLEUM STORAGE TANK RELEASE TRUST FUND

LIMITED SITE ASSESSMENT

REQUEST FOR PROPOSAL

REVISION 11



**Kansas Department of Health and Environment
Bureau of Environmental Remediation
Storage Tank Section
1000 SW Jackson, Suite 410
Topeka, KS 66612-1367**

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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 DEFINITIONS

- 1.3.1 "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.
- 1.3.2 "Field Geologist" is the designated site representative for the vendor. This position works under the direct supervision of the vendor's designated "Project Geologist" or "Licensed Professional". Minimum qualifications for this position are: 1) has a BS 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 3) if performing groundwater sampling must meet the minimum qualifications for Sampling Technician. (Refer to 1.3.8).
- 1.3.3 "Landscaping 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 landscaping professional cannot be an employee of the general contractor.
- 1.3.4 "Licensed Professional" 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) must have a valid and current professional license through the Kansas State Board of Technical Professions 2) must be technically qualified to interpret geologic data. 3) if performing groundwater sampling must meet the minimum qualifications for Sampling Technician. (Refer to 1.3.8). This position is responsible for the preparation and certification of all geological information in reports and on maps.

- 1.3.5 "Petroleum" means petroleum, including crude oil or any fraction thereof, which is liquid at standard conditions of temperature and pressure, including but not limited to, gasoline, gasohol, diesel fuel, fuel oils and kerosene.
- 1.3.6 "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 3) if performing groundwater sampling must meet the minimum qualifications for Sampling Technician. (Refer to 1.3.8).
- 1.3.7 "Project Manager" means the KDHE staff designated to be the lead technical interface with the vendor.
- 1.3.8 "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.
- 1.3.9 "Trained Professional" The minimum qualifications for this position are 1) Bachelor's degree from an accredited four year college or a related degree with a minimum of 30 hours of geologic, hydrogeologic or environmental science course work 2) if performing groundwater sampling must meet the minimum qualifications for Sampling Technician. (Refer to 1.3.8).
- 1.3.10 "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.

1.4 INQUIRIES

- 1.4.1 All inquiries concerning this RFP must be submitted in writing to:

Petroleum Storage Tank Release Trust Fund
1000 SW Jackson, Suite 410
Topeka, KS 66612-1367
Attn: Investigation/LUST Unit Chief FAX: (785) 296-6190

- 1.4.2 Answers to all written questions will be distributed to all participating prospective Vendors by mail.
- 1.4.3 In all cases, no verbal communication will override written communications and only written communications are binding.

1.5 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.

1.6 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.

1.7 SUBMISSION OF PROPOSAL

Two (2) sealed copies of the proposals must be received by the Petroleum Storage Tank Release Trust Fund no later than 3:00 p.m. on the date specified in the Project Information Sheet and the Project Bid Proposal Sheet. Proposals should be addressed to:

Petroleum Storage Tank Release Trust Fund
1000 SW Jackson, Suite 410
Topeka, KS 66612-1367
Attn: Storage Tank Section

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.

- 1.7.1 The outside of the envelope should be marked "**SEALED BID**" in bold lettering. The bid number(s) of the enclosed bid(s) must be displayed on the outside of the envelope. All bids sent in the same envelope must have the same bid deadline. Failure to properly mark the outside of the envelope may result in the bid(s) being disqualified.
- 1.7.2 Late proposals will not be opened. A letter notifying the Vendor, and documentation that the proposal was received after the deadline, will be mailed to the Vendor. The proposal will be stored in KDHE files for a period of one year beyond the closing date for the bid.
- 1.7.3 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.
- 1.7.4 Proposals must be in duplicate and include the following completed documents:
 - 1) Bid Proposal Cover Sheet with Vendor Information
 - 2) Exhibit 2 Project Bid Summary Sheet (multiple site bids only).
 - 3) Exhibit 2 Project Bid Proposal Sheet(s). The vendor's name must appear at the top of each sheet in the designated place.
 - 4) List of all proposed subcontractors, major equipment suppliers, and analytical laboratories.

Proposals must be neat and legible. Proposals that are not properly submitted and/or are not complete will be disqualified.

1.8 WITHDRAWAL OF BIDS

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

1.9 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.

1.10 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.

1.11 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.

1.12 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.

1.13 EVALUATION CRITERIA

Due to the variable nature of sites being investigated, bids will be reviewed to ensure that line item costs are equitably distributed across all required tasks. Prices must accurately reflect the actual cost to complete each segment of the project because additional scopes of work may be required. To avoid the potential problem of vendors unfairly "loading" costs into certain categories to avoid cost proration, KDHE Trust Fund bid proposals will be evaluated on a line item basis. KDHE will review individual line item rates with respect to bids from other vendors for the same project, and to historical costs.

KDHE reserves the right to require an explanation of all higher or lower than reasonable line item costs. The fact that previous bids may have been approved with unreasonable line item costs does not mean that future bids with similar costs will be approved

The following procedure must be used in preparing the bid package:

If a line item unit rate is bid as zero (0) or is left blank, and the activity associated with that line item is required to complete the scope of work, the bid will be rejected as unresponsive.

The unit rate and line item total cost should be entered as "Included" (INC) if the unit cost for that line item is included in the rate for another line item. The line item in which it is included must be specified.

The unit rate and line item total cost should be entered as "NC" if it is proposed to perform the activity at no cost. "NC" will be taken to mean that the no charge rate will apply not only to the

original scope of work, but will also apply to any additional scope of work within the geographic area.

KDHE reserves the right to approve or deny proposed rates and/or quantities on a line item basis. If deemed to be in the best interest of the O/O and the State, KDHE may propose reduced but reasonable (as determined by KDHE using the criteria above) costs for specific line items, and approve the revised total project cost. If the vendor is not willing to perform the task(s) at the reasonable rate, they may withdraw their bid. KDHE will no longer allow costs to be moved between line items to meet the reasonable cost requirement after the bid closing date.

In addition to the above described line item cost evaluation, proposals will be evaluated on the Vendor's 1) total cost as submitted on the Project Bid Proposal Sheets, 2) experience, 3) expertise, and 4) past performance on KDHE Trust Fund Sites. The final determination of approved costs for the project will be in the best interest of the O/O and KDHE.

1.14 CONFLICT OR AMBIGUITIES

Vendors shall notify KDHE immediately if conflicts or ambiguities are found in the Request For Proposal. Failure to do so prior to the specified closing date may result in these items being resolved in a manner deemed to be in the State's best interest as judged by the KDHE Storage Tank Staff.

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 G) or equivalent.
- 2.2.2 For the purpose of contract uniformity, the Owner/Operator Standard Contract (ATTACHMENT G) 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 preform 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.

2.4 ERRORS IN PREPARATION

The Vendor is responsible for any mathematical error or incorrect extension of any calculations in the Vendors' 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-S) naming the O/O as the certificate holder. 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, the issuing company will endeavor to mail 10 days written notice to the certificate holder named to the left, but failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents or representatives."

A copy of this document must be provided to KDHE 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 a 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.

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 of this document, Proposal and Work Specific 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 The vendor is responsible for insuring that work performed under this contract complies with all applicable standard operating procedures (SOP's) as included in the most recent 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 KDHE-Division of Environment (QMP) can be obtained from KDHE or from the KDHE website at:
http://www.kdheks.gov/environment/qmp_2000/qmp_2000.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, trained professionals and sampling technicians.
- 3.1.5 KDHE reserves the right to reject any modification to proposals.
- 3.1.6 Project Bid Proposal and Work Specific definitions can be found in SECTION 6.0 of this bid package.
- 3.1.7 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.

3.2 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 Direct Push Survey

3.3.2.1 If a direct push survey (survey) is required, the primary goal of the survey will be to define the lateral extent of soil and/or groundwater contamination and to determine placement of permanent monitoring wells. The secondary goal of the survey will be to define the degree of contamination within the contaminated area.

A separate work plan must be submitted prior to performing the survey. A separate mobilization and report will be required for the survey. The survey report must include a brief summary of field activities, a table summarizing the results of the survey, area base map indicating probe locations, results, contamination isocontours and proposed monitoring well and soil boring locations.

Include the following information for each survey point in the survey report;

- 1) The direct push ID number,
- 2) The sample matrix (water, soil, or soil vapor),
- 3) The depth at which each sample was collected,
- 4) Soil field screening results
- 5) The analytical results, in parts per billion (ppb) for groundwater (and/or parts per million (ppm) for soil), for each specified constituent, and
- 6) The date each sample was collected.

The Field Work Plan can be submitted with the survey report. The Field Work Plan must be approved prior to mobilization for drilling activities.

3.3.2.2 The Field Geologist who will oversee drilling activities will be on-site and oversee the direct push survey. The Field Geologist will evaluate groundwater and/or soil analytical or field screening results to determine placement of subsequent direct push locations. Only the number of direct push survey points necessary to complete the goals of the survey will be used.

3.3.3 Drilling Equipment and Methods

3.3.3.1 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 projected total depth of the monitoring well 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 under separate letter from the Vendor. KDHE will review the information and provide the Vendor with a written response authorizing or denying the proposed change. All costs associated with the change will be the responsibility of the Vendor.

- 3.3.3.2 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 not be allowed for the installation of groundwater monitoring wells. Continuous samples must be collected using a closed-piston, closed-tube or similar sampling method.
 - 3.3.3.3 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.
 - 3.3.3.4 The selected drilling method(s) must be capable of completing the wells to the depth required without causing the migration or dilution of contamination.
 - 3.3.3.5 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.
- 3.3.4 Drilling and Sample Collection Procedures
- 3.3.4.1 Soil borings exhibiting soil contamination to groundwater should 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.
 - 3.3.4.2 Each borehole completed as a monitoring well must have a minimum borehole diameter of four inches larger than the outside diameter of the casing.
 - 3.3.4.3 A Field Geologist will be on-site 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.
 - 3.3.4.4 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 3.3.8.1, 3.3.8.5 and 3.3.8.6. 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.

- 3.3.4.5 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.
- 3.3.4.6 The Project Geologist or Licensed Professional will stamp and sign the Final Report verifying that all the above drilling and sampling procedures were followed as specified in this RFP.

3.3.5 Monitoring Wells

- 3.3.5.1 Wells will be installed by a KDHE licensed water well contractor using approved drilling methods.
- 3.3.5.2 A KDHE/BER well tag must be permanently attached to the cover (or other appropriate location) of each monitoring well. Instructions for placing the tag are provided in ATTACHMENT D.
- 3.3.5.3 Complete a KDHE/BER well tag form and submit to KDHE. Instructions are provided in ATTACHMENT D.
- 3.3.5.4 All monitoring wells must be securely covered until completed.
- 3.3.5.5 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 or with 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. Installation of flush-mounted wells and monitoring wells with less than 20' of grout (including bentonite plug) require variances from the KDHE Bureau of Water.

- 3.3.5.6 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 than 100 feet shall be constructed using a minimum of 4 inch I.D. casing and screen.
- 3.3.5.7 Unless otherwise specified in EXHIBIT 1 the screen length will be based on estimated groundwater depth. Screen length should 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.
- 3.3.5.8 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.
- 3.3.5.9 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.
- 3.3.5.10 All monitoring wells must be properly developed (see Section 6.2.3 and ATTACHMENT H 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 to 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 and include as part of the field notes and on Table 2.5, Groundwater Analytical Results.

3.3.6 Hydrologic Properties of the Site

- 3.3.6.1 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. For KRBCA scopes of work two borings will be drilled specifically for the collection of hydrologic samples.
- 3.3.6.2 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 using 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.
- 3.3.6.3 If monitoring wells are completed in different geologic zones, a hydrologic test must be performed on each zone.
- 3.3.6.4 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.

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

- 3.3.6.5 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:

$$n = 1 - \frac{P_b}{P_s}$$

Where,

n = porosity (cc/cc)

P_b = dry bulk density (g of dry soil/cc of soil)

P_s = specific gravity of particle density (g/cc)

A value for specific gravity of 2.65 g/cc can be assumed for most mineral soils.

- 3.3.3.6 For all KRBCA scopes of work, drilling should cease after the last sample is collected from each boring from which samples for hydrologic tests are collected.
 - 3.3.3.7 For KRBCA scopes of work, two borings will be drilled specifically for the collection of hydrologic samples.
- 3.3.7 Waste Disposal and Borehole Plugging
- 3.3.7.1 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 (28-30-7(d)) until a Trust Fund investigation has been completed.
 - 3.3.7.2 All waste soils and waste water generated during the investigation will be treated and disposed of in accordance with all local, state, and federal statutes and regulations. See also Sections 6.1.23 and 6.1.28 of this RFP.
- 3.3.8 Field and Laboratory Water and Soil Sample Analysis
- 3.3.8.1 All borings will be continuously sampled with split spoon samplers, and/or continuous samplers. Sand catchers will be used when necessary to maximize recovery in sand units. Duplicate soil samples for field screening and potential laboratory analysis will be collected from 5' intervals for borings extending to 50' or less. The samples collected for field screening and potential laboratory analysis will be collected from the one foot interval showing the highest level of contamination within the five foot intervals (0 - 5', 5 - 10', 10 - 15', etc.) as determined by the field geologist. The exception will be the 0 -5' interval which will also include the 0 - 1' interval if surficial soil samples are required.

For borings that extend to a depth greater than 50 feet, the upper 50 feet will be continuously sampled and samples collected for field screening and potential laboratory analysis as above unless otherwise approved by the KDHE Project Manager. From 50 feet below ground surface to total depth the boring will be continuously sampled with split spoon samplers and/or continuous samplers. Samples collected for field screening and potential laboratory analysis will be collected from the one foot interval showing the highest level of contamination within the ten foot interval (50 - 60', 60 - 70', etc.) as determined by the field geologist.
 - 3.3.8.2 A headspace analysis will be conducted on the duplicate sample for all potential laboratory analyzed 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.

- 3.3.8.3 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 70⁰F 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.
- 3.3.8.4 Up to seven soil samples from each soil boring will be submitted for laboratory analysis. Soil samples that are submitted for laboratory analysis must be gathered from the unsaturated zone. The unsaturated zone for unconfined environments is defined as that portion of the column which is above static water level. If static water level cannot be determined prior to submitting soil samples to the laboratory, the KDHE Project Manager should be contacted to determine whether the soil samples should be submitted for laboratory analysis.
- 3.3.8.5 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. This condition exists at sites that do not currently have a concrete, asphalt or other paved surface or are likely not to have such surfaces in the future.
- 3.3.8.6 For sites where static water level is <15 feet below ground surface, 0 - 1' soil samples (if surficial soils samples are required), soil samples collected from within the 1 – 5 and 5 – 10 foot intervals and soil samples collected immediately above the capillary fringe or bottom of the borehole will be submitted for laboratory analysis.

For sites where static groundwater is ≥ 15 and < 20 feet below ground surface, 0 - 1' soil samples (if surficial soils samples are required), soil samples collected from within the 1 – 5, 5 – 10 and 1 - 15 foot intervals and soil samples collected immediately above the capillary fringe or bottom of the borehole will be submitted for laboratory analysis.

For sites where static groundwater is ≥ 20 and < 25 feet below ground surface, 0 - 1' soil samples (if surficial soils samples are required), soil samples collected from within the 1 - 5, 5 - 10, 10 -15 and 15 - 20 foot intervals and soil samples collected immediately above the capillary fringe or bottom of the borehole will be submitted for laboratory analysis.

For sites where static groundwater is ≥ 25 and < 30 feet below ground surface, 0 - 1' soil samples (if surficial soils samples are required), soil samples collected from within the 1 - 5, 5 - 10, 10 - 15, 15 - 20 and 20 - 25 foot intervals and soil samples collected immediately above the capillary fringe or bottom of the borehole will be submitted for laboratory analysis.

For sites where static groundwater is ≥ 30 feet below ground surface, 0 - 1' soil samples (if surficial soils samples are required), soil samples collected from within the 1 - 5 and 5 - 10 foot intervals and soil sample collected showing the highest field screening collected from within either the 10 - 15 or 15 - 20 foot intervals and two soil samples collected from within the five foot intervals greater than 20' below ground surface and above the capillary fringe showing the highest field screening and soil samples collected immediately above the capillary fringe or bottom of the borehole will be submitted for laboratory analysis.

If field analysis indicates no petroleum contamination, samples submitted should be from the intervals stated above which appear most conducive to petroleum migration. Duplicates not submitted for laboratory analysis may be properly disposed after the borehole is completed.

- 3.3.8.7 At least one groundwater sample will be collected from each monitoring well installed as part of the investigation except for wells containing separate phase hydrocarbon product. 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 should be sampled. All ground water 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.

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.

Upon request by the KDHE Project Manager, two replicate groundwater samples from specified wells will be submitted to KDHE within 48 hours of collection, excluding weekends and KDHE holidays. A representative of the Vendor will contact the KDHE Project Manager prior to groundwater sampling to determine if replicate samples will be submitted. Do not submit replicates of PAH or product samples to KDHE. Samples submitted to KDHE will be labeled using a waterproof marking instrument (pencil, indelible ink, etc.) with the KDHE site name, KDHE project code, date and time collected, and the well from which it was collected. Samples with Chain-of-Custody forms, and a field map showing the location of each well and approximate groundwater flow direction, should be shipped or hand delivered to the KDHE Project Manager to reach KDHE between 8:30 am and 4:30 pm Monday through Friday, excluding KDHE holidays. Do not send replicate samples directly to the KDHE laboratory.

One trip blank will accompany each sample container containing samples that will be submitted for VOC analysis. Trip blanks are not required for containers that contain samples that will be analyzed for TPH, OA-2 and/or PAH.

Trip blanks should 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.

Replicates will be analyzed by the KDHE laboratory and 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 replicate sample analyses, the Vendor may be required to resample all monitoring wells at the Vendor's expense. Results will be considered acceptable if the % difference between the Vendor's lab and the next closest lab's results does not exceed 25%.

- 3.3.8.8 Groundwater samples will not be collected for laboratory analysis if separate phase hydrocarbon product is present in the well. The Vendor shall record in the field notes a complete description of the product including thickness of the product layer, color, odor, and viscosity and indicate the type of product suspected.
- 3.3.8.9 A sample of the hydrocarbon product will be collected and will be analyzed by a laboratory certified by KDHE. If free product is detected in more than one well, collect only one product sample unless it is suspected, based on the potential sources and product appearance, that the product type or mixture of types differs in different wells. The analysis will indicate the type(s) of fuel detected.
- 3.3.8.10 All laboratory analyses will be performed by a laboratory certified by KDHE for the specific analyte(s) and laboratory method, if certification is available for the proposed method, as outlined in ATTACHMENT C.
- 3.3.8.11 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. Product samples will be transported in a separate container from groundwater and soil samples.

3.3.9 Property Access

- 3.3.9.1 The Vendor is responsible for contacting all on-site and off-site property owners to obtain access. Written authorization will be obtained from the owner of each property where access is necessary. Initial contact may be

verbal, but written permission must be obtained from each owner of each property to be accessed prior to mobilizing equipment to the site to begin direct push and/or drilling operations. 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.

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 should be notified in writing. Written notification should include copies of letters sent, phone records, field notes, any additional supporting documentation, and request KDHE's assistance in acquiring access.

3.3.9.2 For off-site access, the Vendor should use city and utility easements when appropriate and necessary. Written permission to drill in city and utility easements must be obtained prior to equipment mobilization. In such cases, the Vendor must obtain written permission from both the property owner and the entity granting the easement. Copies of all signed access agreements should be included in Appendix 6 of the Final Report.

3.3.9.3 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.

3.3.10 Property Restoration

3.3.10.1 Any property damaged or destroyed during this investigation must be restored to its original condition within 30 calendar days after the damage or destruction has occurred. All costs associated with the restoration are the responsibility of the Vendor.

3.3.10.2 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.

3.3.11 Monitoring Well Surveying

3.3.11.1 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 6 of the Final Report.

3.3.11.2 Establish a permanent datum control point (benchmark) on-site.

- 3.3.11.3 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:

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.

- 3.3.11.4 Identify and document all benchmarks used in determining the site benchmark.
- 3.3.11.5 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).
- 3.3.11.6 The datum point for each monitoring well will be recorded within 0.01 vertical feet accuracy relative to the site benchmark.
- 3.3.11.7 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.
- 3.3.11.8 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.

3.4 MONITORING FIELD WORK

3.4.1 One Year Post LSA Monitoring

- 3.4.1.1 The monitoring scope of work, including report submittals, will be conducted in accordance with the most recent Monitoring RFP. The Monitoring RFP can be accessed by contacting Ms. Sharon Elder at (785) 296-1030, selder@kdhe.state.ks.us or 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.
- 4.1.2 Completed Project Bid Proposal Sheets.

- 4.1.3 Copy of Insurance Certificate*
- 4.1.4 Resumes and OSHA safety training certification of personnel proposed for the project*
- 4.1.5 Complete list of equipment*
- 4.1.6 Drill Rig Specifications*
- 4.1.7 Quality Assurance and Quality Control (QA/QC) plan*
- 4.1.8 Workers Compensation Log & Summary of Occupational Injuries & Illness (OSHA form G200)*
- 4.1.9 List of all sub-contractors with a description of their duties and, if applicable, copies of their OSHA safety training certificates. If the sub-contractor is to serve as the Vendor's Field Geologist, Licensed Professional, Project Geologist, Sampling Technician or Trained Professional, a copy of their resume is to be submitted to KDHE indicating their qualifications as outlined in Section 1.3, DEFINITIONS.

4.2 FIELD WORK PLAN SUBMITTALS

- 4.2.1 The Vendor will complete and submit two copies of the Field Work Plan (ATTACHMENT E) 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. 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 a Trained Professional, Field Geologist, Project Geologist or Licensed Professional.

The Field Work Plan prepared 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, with 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 facsimile or 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 O/O, current property owner, current site tenant, owners and tenants of any property on which off-site borings or monitoring wells are to be installed, the KDHE Project Manager and the KDHE District Office Representative by telephone or in writing at least two working days in advance of drilling.

The KDHE Project Manager and District Office Representative should again be contacted immediately following the initiation of drilling activities. If a direct push survey is to be performed, the same notifications are required.

The advance notice(s) will include the date and time the field activity is scheduled to begin. Schedule changes must be reported in the same manner as they occur. A Field Work Notification Form is included with this RFP and can be used by the Vendor (fax, mail, or e-mail) to notify KDHE of field work dates (ATTACHMENT J).

- 4.3.2 The Vendor will notify the O/O and the KDHE Project Manager, by telephone or in writing, when all drilling activities and hydrologic tests have been completed. The notification will include the date field work was completed. This notification must be immediately after the work is completed.
- 4.3.3 The Vendor will notify the O/O, the KDHE Project Manager, and the KDHE District Office Representative by telephone or in writing, at least two working days in advance of when groundwater sampling events are to occur. The notification will include the date and approximate time that field work will take place. ATTACHMENT J can be used for this notification.
- 4.3.4 The Vendor will notify the O/O, current property owner, current site tenant, owners and tenants of any property on which monitoring wells were installed, the KDHE Project Manager and the KDHE District Office Representative by telephone or in writing at least two working days in advance of well plugging activities.
- 4.3.5 Schedule changes must be reported to the O/O, the KDHE Project Manager and District Office Representative by telephone or in writing immediately as they occur. Approval to

proceed with any field activities mentioned in 4.3.1 - 4.3.4, 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.

The Vendor will submit two copies 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. Specific sections of the final report will also be submitted in electronic form on a compact disk (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; site name; site address; KDHE project code; KDHE facility I.D. number; section, township, and range to four quarters; report date, and the name of the person who prepared the report. Cover page must be stamped and signed by a Kansas Licensed Geologist or Licensed Professional.

Each Final Report will include a table of contents with the following information:

- 1) section titles (see 4.4.4 below) for sections 1-5,
- 2) titles and page numbers for tables 2.1-2.9,
- 3) titles for figures 1- 8,
- 4) titles for each appendix in Section 6, 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 should 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 free product thickness, should 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: Include a detailed summary of all past and present work performed at the site. Identify any nuisance conditions associated with the release(s) from the site. Determine if any drinking water wells or surface waters have been impacted by a release from the site. State if public water is being supplied to the site and surrounding areas.
- 1.2 Regional Geology: Review local and regional geologic and/or hydrogeologic maps, nearby site assessments and/or investigation reports and any other pertinent publications. Identify any aquifers and/or surface water bodies serving as sources of drinking water for the area. Identify and evaluate the use and/or potential use of the uppermost groundwater zone and/or impacted groundwater zones within 0.25 miles of the source of the release at the facility.
- 1.3 Land Use: Investigate and describe past, current, and potential future uses of the site. Identify potential source areas, migration pathways, and receptors. Indicate and describe all subsurface structures that are potential or current receptors of contaminated media. Determine past and current uses of adjacent properties to identify other potential sources of COC. If an off-site receptor is identified, assess the past, current and potential future land use. Future land use assumptions should be based on current use, existing zoning, and development trends of adjacent properties. 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. Identify the current predominant land use of the area as residential, commercial, recreational, agricultural, or undeveloped. Identify sensitive receptors, such as surface water bodies, wildlife sanctuaries, and wetlands.
- 1.4 Source History: Locate current and/or former tank systems and other potential sources such as spills or overfill incidents, both on and off-site. Investigate and summarize any previous assessment work, such as tank removal data, previous site assessments, release investigations and/or remediation activities that may have been conducted on-site and on adjacent properties.

SECTION 2.0 TABLES

Tables must be labeled with site name, 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 should 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 number of groundwater survey probes conducted,

- 4) total footage drilled,
- 5) total monitoring well footage,
- 6) total boring footage plugged,
- 7) total number of groundwater samples analyzed by laboratory,
- 8) total number of soil samples analyzed by laboratory,
- 9) total number of product samples analyzed by laboratory,
- 10) total number of waste water 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 off site waste disposal should 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 wells located within a 1/4 mile radius of the site.

- 1) the well owner's name,
- 2) the Section, Township and Range of the well location to three quarters, or to four quarters for wells sampled or located during the investigation, or used as a public water supply,
- 3) the use; select the use from those found in Section 4 of the WWC-5 form that best describes the use of the well,
- 4) the distance between the well and contaminant plume; give an approximate distance if the well location is known to only three quarters,
- 5) 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 should 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 identification number from the KDHE well tagging Site I.D. form,
- 4) the surveyed elevation of the well's vertical datum control point (survey pin or permanent mark on flush mount rim, see Section 3.3.11.5),
- 5) the surveyed elevation of the top of well casing
- 6) the depth , to groundwater below top of well casing in feet prior to development/purging
- 7) the depth, to groundwater below top of well casing in feet prior to sampling,
- 8) static groundwater elevation prior to purging (or development if wells are sampled the same day as development and the wells are not purged),

- 9) static groundwater elevation prior to sampling,
- 10) total depth of well
- 11) the date static water level was measured prior to development/purge.
- 12) the elevation of the air/product interface, (if applicable)
- 13) the thickness of the separate-phase product.(if applicable)

Groundwater levels must be measured under static conditions within the same 24 hour period. If free-phase petroleum product is detected, groundwater elevations must be corrected using the specific gravity (see Section 6.1.17 of this RFP) determined during the product sample analysis. Explain at the bottom of the table how the measurements were corrected.

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 test method and laboratory analytical sample detection limit for each analyte in each laboratory sample,
- 7) the field instrument used for each field sample,
- 8) tier 2 risk based screening levels.

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

Table 2.5 Groundwater Analytical Results

Present all results for each sample point. Private wells and PWS wells should be designated consistently throughout the report. Include the following information for each groundwater and petroleum product 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 product 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 test method and analytical sample detection limit for each analyte in each sample,
- 9) tier 2 risk based screening levels.

*Constituents are Total BTEX, Benzene, Toluene, Ethylbenzene, Total Xylenes, 1,2

Dichloroethane(1,2 DCA), Methyl Tertbutyl Ether (MtBE), Tertiary Butyl Alcohol, (TBA), Naphthalene, Ethylene Dibromide (EDB), TPH GRO and TPH DRO. Other constituents detected from full VOC, and/or PAH scans should also be included in the table.

Table 2.6 Direct Push Survey Results

Include the following information for each groundwater survey probe sample:

- 1) the direct push ID number,
- 2) the sample matrix (water or soil vapor),
- 3) the depth at which each sample was collected,
- 4) the analytical results, in parts per billion (ppb) for each specified constituent,
- 5) the date each sample was collected.

Table 2.7 Unsaturated Zone Hydrologic Tests and Properties

Table 2.7a Include the following information for each unsaturated zone hydrologic test conducted:

- 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 (ASTM, EPA) for the Grain Size Analyses and/or the permeability tests,
- 4) the sample collection method,
- 5) the hydraulic conductivity value in centimeters per second (cm/sec),
- 6) the lithologic description of each sample.

Table 2.7b Include the following information for each unsaturated zone hydrologic test conducted:

- 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) estimated porosity (cm^3/cm^3),
- 5) gravimetric water content (g/gm) (ASTM Method D2216),
- 6) volumetric water content (cm^3/cm^3) (Calculation from ASTM Method D2216),
- 7) dry bulk density (g/cm^3) (ASTM Method D2937),
- 8) organic matter (% organic matter) (ASTM Method D2974)
- 9) total organic carbon (% organic carbon) (ASTM Method D2974)

Table 2.8 Saturated Zone Hydrologic Tests and Properties

Include the following information for each monitoring well used for the saturated zone tests:

- 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) (show calculations),
- 6) known or estimated yield of uppermost aquifer within a 24 hour period. (provide

- source).
- 7) area specific annual rainfall in inches per year (provide source).

Table 2.9 Waste Handling Results

Include the following information for wastes handled:

- 1) the type of waste (soil or water) generated,
- 2) the quantity of waste generated for each type of waste,
- 3) the storage and disposal methods used for each type of waste,
- 4) results of any field analysis of wastes conducted during on-site treatment,
- 5) results of any laboratory analysis of wastes,
- 6) specific location where wastes were disposed or discharged.

SECTION 3.0 MAPS

All maps must be drawn to scale and labeled with the titles provided, site name, and project code. Do not reference or include in this section any discussion, tables, photographs, drilling logs, or other documents included in this or any other report.

The scale for figures 3 through 6 should be approximately 1 inch \leq 50 feet for smaller sites and 1 inch \leq 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 8.5" X 11" or 11" X 17". If warranted, the KDHE Project Manager should be contacted for approval to use a scale or figure size other than specified herein. Include a north arrow, scale, and legend on all maps. Legends should include only those items that occur at the site.

Figures 2 through 6 should include wells and borings, with ID numbers, and only those labels necessary to describe information requested for that specific map. Private and PWS wells should be designated consistently throughout the report.

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 should be clearly marked. Highlight or mark the location of the site. Contours and other information should 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 350 foot radius around the source(s) of contamination. Figure 2.2 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. Figure 2.1 will have an approximate scale of 1" = 100'. Figure 2.2 will have an approximate scale of 1" = 125'. Maps should be on 8 ½" x 11" or 11" x 17" paper.

The following should be included on both maps: 1) all groundwater probes, soil borings, and wells. 2) property boundaries and buildings 3) identify the general use (residential, park, undeveloped, industrial, commercial) of properties in this area. 4) business names 5) property owners name 6) locations or former locations of all tanks, lines, buildings, roads and other fixed objects on the facility property 7) locations of all underground utility trenches and overhead lines within 100 feet of the contaminant plume(s). State the type and depth of each utility service. 8) basements if door to door search is required.*

* If groundwater is less than 25 bgs or soil contamination is detected less than 25 feet bgs a door to door search for basements must be made within a 500 foot radius of the source of contamination.

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 should be noted on the map. Show flow line used for calculating hydraulic gradient.

Figure 4 Soil Isoconcentration Maps

Develop, down to laboratory non-detect (ND) levels, Total Petroleum Hydrocarbon (TPH) soil contamination maps showing the extent of soil contamination. Figure 4.1 will be for TPH GRO and Figure 4.2 will be for TPH DRO. Use Figure 2 as the template and show the locations of all borings. The estimated areal extent of soil contamination above the capillary fringe must be outlined.

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 TPH concentration in ppm, and the depth at which each sample was collected. Label isoconcentration lines with the concentration in ppm. If more than one TPH DRO constituent was identified, the concentration of each constituent should be given for each sample point at which it was detected. For contouring purposes, use the total TPH DRO concentration for each sample point. If the constituent being mapped was not detected in any boring, submit a map showing all sample points labeled as above with the concentration stated as ND.

Figure 5 Groundwater Isoconcentration Maps

Develop, down to non-detect (ND) levels, all groundwater isoconcentration maps outlined below. Use Figure 2 as the template and show all monitoring wells and sampling points, with ID numbers, sampled during the investigation. Label sample points and 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, submit a map showing all sample points labeled as above with the concentrations labeled as ND.

- 5.1 Groundwater Probe Survey - Total BTEX in probes
- 5.2 Total BTEX in wells
- 5.3 Benzene in wells
- 5.4 1,2 Dichloroethane in wells
- 5.5 MtBE in wells
- 5.6 TBA in wells
- 5.7 Naphthalene in wells
- 5.8 EDB in wells
- 5.9 TPH OA-1 in wells
- 5.10 TPH OA-2 in wells

Figure 6 Separate Phase Product Isopach Map

Develop a product isopach map, using Figure 2 as the template, any time separate phase product is detected. Each map shall include the location of all monitoring wells or sampling points along with the product thickness in feet. If more than one product is identified, specify the products and their approximate percent of the total product phase.

Figure 7 Wells within ¼ Mile*

The map will be enlarged such that the facility is located at or near the center of the map. The map will have a scale of approximately 1" = 300' and be on an 11" x17" page. All wells will be clearly marked and labeled as to the current use (eg: industrial, public drinking supply, monitoring). For properties with multiple wells, indicate the number of wells in each category located on the property.

If the contaminant plume is expected to extend beyond ¼ mile from the facility, the map (scale) will be modified to include all wells potentially impacted by the release. Well descriptions may appear on an attached table. Generalized groundwater flow direction will be clearly indicated.

Figure 8 Land Use within ¼ mile*

Map will clearly indicate current land uses within a ¼ mile radius of the facility. The map will have a scale of approximately 1" = 300' and be on an 11" x17" page. The facility will be at or near the center of the map. If the contaminant plume is expected to extend a distance greater than ¼ mile, the scale of the map will be changed to include the areas potentially affected. At a minimum, the maps must include either residential or non residential. If a sensitive receptor such as a subsurface structure, school or hospital is present within this area, that structure must be indicated on the map.

* Maps must be CAD drawings or enhanced versions of the most recent aerial photographs of the specified area. Locations and names of all major streets must be included on the maps. Topographic maps will not be accepted.

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 boring and monitoring well ID number,
- 2) the date the drilling was conducted,
- 3) the names of the Driller and Geologist,
- 4) the drilling method/type of drill rig, soil sampling equipment, and field screening analysis equipment used,
- 5) borehole and casing diameters,
- 6) field screening results plotted at the depth measured,
- 7) a continuous soil profile will be developed with detailed lithologic descriptions using the Unified Soil Classification System (USCS). 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,
- 8) observations such as fracturing or solution cavities, organic content, staining, odor, moisture changes (dry, moist, saturated), and any other pertinent features,
- 9) a monitoring well construction diagram that accurately depicts the depth of the screen, blank casing, filter pack, bentonite seal, grout seal, well-head completion, and the surveyed elevations of the top of the casing and the permanent datum control point (see Section 3.3.11.5) on the pad or flush mount rim,
- 10) for plugged borings, plugging material and interval of each material,
- 11) depth the saturated zone was encountered during drilling and elevation of static water level prior to development/purge,
- 12) 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

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

- 5.1.1 Two photographs of the entire facility from two distinctively different directions.
- 5.1.2 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 product recovery or remediation system components.
- 5.1.3 One photograph each of two different monitoring wells completed by the vendor as part of this investigation. Include the well number in the description. One of the photographs will have the cast iron cap removed to show the lockable waterproof cap KDHE numbered well lock, and KDHE/BER well tag.
- 5.1.4 Two photographs showing the scarified soils on site.

5.2 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.

5.3 Photographs must be current and reflect the property condition at the time drilling operations were completed.

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 KDHE/BER Well Tag Form & KDHE Water Well Records

Include a copy of the KDHE/BER Well Tag Form and copies of the KDHE Water Well Record (form WWC-5) for each monitoring well installed.

Appendix 2 Unsaturated Zone Hydrologic Data

Include all raw data (laboratory test data, sieve analysis results, grain size distribution plots, etc.) and calculations used to determine the unsaturated zone hydrologic characteristics. Identify the variables and provide the calculated or assigned values. Include all information submitted by the laboratory on sheets provided by the laboratory and the chain of custody forms.

Appendix 3 Saturated Zone Hydrologic Data

Include all raw data (plots of graphical analyses, laboratory test data, sieve analysis results, grain size distribution plots, etc.) and calculations used to determine the saturated zone characteristics. Identify the variables and provide the calculated or assigned values. If values are calculated by a computer program, include a copy of the computer output and state the program used. Include chain of custody forms.

Appendix 4 Laboratory Data

Include all analytical laboratory reports and Chain of Custody documents. 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.

Reporting limits for all samples must be the Practical Quantitation Limit (PQL) for that sample. Reporting limits set at the MCL are not acceptable. Include results of free product analyses (including laboratory chromatographs) if product samples were collected.

Appendix 5 Field Notes

Field notes must be hand-written and 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) the Field Geologist's notes from the groundwater survey, if a groundwater survey was conducted,
- 2) 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,
- 3) 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 6.2.5 and ATTACHMENT H 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,
- 4) any and all other field notes recorded during the investigation,
- 5) 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 should not include a general summary of methods and procedures used during the assessment.

Appendix 6 Reports, Access Agreements, Lien Releases, Ownership and Business Search Documentation

Include copies of the following:

- 1) the RLS surveyor's report,
- 2) the Kansas Geological Survey water well search report. Designate wells within 1/4 mile of contaminant plume,
- 3) all signed access agreements (see Section 3.3.9 of this RFP),
- 4) copy of the site specific Bureau of Water waiver to install flush mount wells,
- 5) copy of site specific Bureau of Water waiver to install wells with less than 20 feet of grout (including bentonite plug),
- 6) copy of the wastewater disposal waiver letter from the Bureau of Water,
- 7) all signed lien releases,
- 8) current and previous business names and property uses (commercial, industrial, residential) of the facility and whether fuel was dispensed at the facility by previous owners,*
- 9) list of current and previous owners of the facility with current address(es) including the dates of ownership for each owner.*

* Documentation of property record search used to complete list of previous or current business names, owners and property use must be included.

Appendix 7 Direct Push Survey Groundwater Data

If a groundwater survey was conducted, include all groundwater survey analytical results. The groundwater survey report must bear the name of the company and/or the individual that conducted the work.

Appendix 8 Off-Site 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 and invoices, etc.

Electronic Data

The following information must be supplied on a Compact Disc (CD) within two weeks of report approval. The CD will contain the following information.

- 1) The following portions of the final report must be submitted in any word processing document.
 - 4.5.2 - Cover Page
 - 4.5.3 - Table of Contents
 - 4.5.6 - Final Report Format, Section 1.0, Site Summary
- 2) The data included in Tables 2.1 through 2.8, under Section 2.0 Tables, in section 4.5.6, Final Report Format will be submitted in Excel or Quattro Pro spreadsheet or in Microsoft Access Database format.
- 3) Figures 2 through 6 under Section 3.0 Maps, in section 4.5.6, Final Report Format will be submitted in CAD files in a DXF interchange format (preferred) or as a JPG (Joint Photographic Experts Group format). The file must be named according to one of the following conventions. Site name, last five digits of project code followed by .dxf or .jpg. Example: ABCgasstation12375.dxf

SECTION 5.0 REIMBURSEMENT

5.1 REIMBURSEMENT GUIDELINES

- 5.1.1 The completed Request for Reimbursement form, Vendor invoice and supporting documentation must be submitted in duplicate to: A) directly to KDHE when the Vendor has limited power of attorney from the O/O. B) or to the O/O for signature and forwarding to KDHE when there is no limited power of attorney.
- 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 Payment to the Vendor will be prorated in accordance with actual work performed (i.e. if only 50% of the scheduled drilling activities are required, 50% of the drilling activities will be reimbursed). Any line item from the Project Bid Sheet that is priced by the hour, day or week will be prorated when the full scope of work is not required.
- 5.1.5 The Vendor may submit invoices for reimbursement at the following stages of the investigation phase:

<u>Completion</u>	<u>Invoice Amt.</u>	<u>Pay Amount</u>
Work Plan & Drilling	100%	90% of the approved invoiced amount. Work must be completed.
Sampling, Analytical, Hydrologic Testing	100%	90% of the approved invoiced amount. Work must be completed.
Final Report	100%	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

- 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. 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.
- 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.

5.2 DOCUMENTATION REQUIREMENTS

- 5.2.1 Daily time sheet logs for all office and field activities must accompany all vendor invoices for services provided. Field time sheets must be signed by the Vendor on-site supervisor and the on-site O/O or O/O representative. Daily time sheet logs included in ATTACHMENT F should be used for this purpose; the vendor's time records can be substituted provided they include all the information on the form in ATTACHMENT F and are signed by the supervisor of the staff person being billed.
- 5.2.2 Each line item must be invoiced in the same format (rates and units) as the Bid Proposal Sheets.

SECTION 6.0 PROPOSAL AND WORK SPECIFIC DEFINITIONS

6.1 PROPOSAL DEFINITIONS

6.1.1 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.

6.1.2 DECONTAMINATION

This item shall include the per foot cost for all sampling and drilling decontamination equipment and supplies.

6.1.3 DIRECT PUSH SURVEY

This item shall include the per survey cost for conducting the soil and/or groundwater survey. The per survey cost shall include all activity relative to each survey; i.e., mobilization, necessary equipment, survey installation to groundwater, soil and/or soil vapor extraction, field analysis of the sample, removal of the survey equipment, crew member(s) to conduct the survey, and Field Geologist to oversee the survey. The equipment used for analyzing samples during a field survey must detect and quantify concentrations for each specified compound (benzene, toluene, ethylbenzene, and xylene) with detection levels equal to or less than the smallest KDHE Tier 2 Risk-Based Screening Levels for each constituent. Any contamination detected, even if below KDHE Tier 2 Risked-Based Levels, must be documented and included in the probe survey report.

6.1.4 DIRECT PUSH SURVEY REPORT

This item shall reflect the cost to produce and submit two copies of a map indicating survey point locations, associated field analytical data and proposed locations for soil borings and permanent monitoring well placement. This map will be reviewed by the KDHE Project Manager within seven (7) calendar days. The KDHE Project Manager will approve the proposed boring and permanent monitor well placement or request revisions to those placements.

6.1.5 DRILL RIG /WITH CREW

This item shall include all costs associated with use of the drilling rig, drilling crew, and all drilling equipment. This should only include the driller and helper(s). Do not include any professional field staff responsible for collecting and conducting field analyses of drilling samples. This item must be bid on a footage basis. If additional footage is required, reimbursement will be on a per foot basis.

6.1.6 FIELD GEOLOGIST

This item shall include the cost for the Field Geologist as defined in Section 1.3.2 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 included on page 1 of EXHIBIT 2. Costs are submitted for Field Geologist directly associated with on-site drilling activities and separate travel time.

6.1.7 FIELD TEST EQUIPMENT

This item shall include the per day cost to use the listed field analytical equipment such as a

photoionization detector, organic vapor analyzer, colorimetric detector tubes, interface probe, etc.

6.1.8 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 E.

6.1.9 FINAL REPORT (ASSESSMENT PHASE)

This item shall include all labor and equipment cost to properly complete and submit the Final Report. The Final Report requirements and format are included in SECTION 4.5.6 of this document.

6.1.10 LAB METHODS

This item shall include designation of the EPA methods (see ATTACHMENT C of this RFP) to be used for laboratory analysis of soil and water samples.

6.1.11 LABORATORY NAME

This item shall include the designation of the KDHE-approved laboratory that will be performing the analyses of water and soil samples.

6.1.12 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 per mile basis. Staff time will not be included on this line item. Staff time for mobilization will have a separate staff travel time line item. Staff travel time will be bid on a per hour basis.

6.1.13 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).

6.1.14 OTHER

This item shall include all costs not included in other items of the cost proposal sheet. If this category is used, the bidder must list each item and briefly explain its function.

6.1.15 OTHER STAFF (ASSESSMENT PHASE)

This item shall include the cost for other staff that are necessary to properly complete the tasks required in the categories listed. Provide the title of the individual who will perform the duties. This item shall be bid on an hourly basis.

6.1.16 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 on site overnight.

6.1.17 PRODUCT SAMPLES

This item shall include all costs associated with the collection and analysis of the product sample

(i.e. labor, equipment, shipping, etc.). The purpose of the product 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. The product sample analysis must include measurement of the specific gravity. 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.

6.1.18 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>. For purposes of this proposal, assume that all Groundwater Isoconcentration maps required for the assessment phase will be required at each monitoring event.

6.1.19 RIG MOBILIZATION

This item shall include all costs for moving drilling equipment, drilling personnel, and drilling supplies to and from the site, and to locations throughout the area to be drilled. Only one mobilization has been allowed. Costs for multiple rigs, if required, must be included.

6.1.20 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.

If the appropriate test is not conducted, reimbursement for the incorrect test will be denied. If any hydrologic test other than a permeability test is requested, it will be indicated on page 1 of Exhibit 2.

Under certain circumstances the KDHE Project Manager may request grain size analysis be performed using ASTM method D 422.

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.

6.1.21 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.

6.1.22 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.

6.1.23 SOIL WASTE HANDLING AND TREATMENT

This item shall include costs for handling and treating drill cuttings generated during the field investigation. If possible treatment of soils/cuttings 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.

In anticipation where waste soils cannot be treated on-site, 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.

If soils/cuttings will be disposed of offsite 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 on site following drilling activities. These handling and treatment methods are not approved for waste saturated with petroleum products.

6.1.24 STAFF (MONITORING)

This item shall include the cost for the Sampling Technician as defined in Section 1.3.8 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.

6.1.25 SUPPORT VEHICLE (ASSESSMENT PHASE)

This item shall include the cost for all vehicles necessary to transport all staff to conduct the investigation. This item will be bid on a per day basis per vehicle and is inclusive of all incidental costs i.e. tolls, maintenance expenses, fuel, etc.

6.1.26 SURVEYING

This item shall include the cost for surveying by a Registered Land Surveyor. This item shall be bid in two parts on a per monitoring well basis to accommodate the minimum and maximum scope of work.

6.1.27 UNSATURATED ZONE (Permeability, Grain Size, Total Organic Carbon, Water Content, Bulk Density)

This item shall include the cost to conduct a minimum of two permeability tests per site using ASTM Method D2434. Each test must be conducted on different lithological soil samples collected in the area(s) of the unsaturated zone determined to be the most highly contaminated using field testing methods.

If the appropriate test is not conducted, reimbursement for the incorrect test will be denied. If any hydrologic test other than a permeability test is requested, it will be indicated on page 1 of Exhibit 2.

Under certain circumstances the KDHE Project Manager may request two grain size analysis be performed using ASTM method D 422.

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.

6.1.28 WASTEWATER HANDLING

This item shall include the cost to handle, treat and dispose of waste water generated during field activities. Waste water will include, but not be limited to, development, purge and decontamination water. Methods for handling and treating waste water will be as follows. Air stripping, granulated activated carbon or other treatment may be acceptable. The Vendor will properly dispose of waste water 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 free product. No water is to be stored on site. This item must be bid on a lump sum basis per event.

6.1.29 WATER SAMPLES

This item shall include the total cost associated with the collection and analysis of water samples (i.e. mobilization, purging, 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. This item must be bid on a per sample basis. If additional samples are required, reimbursement will be on a per sample basis.

6.1.30 WELL COMPLETION

This item shall include the cost for a monitoring well pad, flush or stick up protective locking cover, lock, well development, and well tagging requirements. All monitoring wells must be completed in accordance with regulations and KDHE guidelines (see ATTACHMENT A) and must be locked prior to demobilization. All wells must be developed to the extent that each well can be fully used for its intended purpose. This cost shall be bid on a per well basis.

6.2 WORK SPECIFIC DEFINITIONS

6.2.1 INITIAL SOIL BORING(S)

Unless directed otherwise by KDHE in the Site Specific Information (EXHIBIT 1), the initial soil boring(s) will be drilled at the location(s) nearest the reported source(s) of contamination and continue to groundwater. In locations where no groundwater is expected to be encountered the initial soil boring(s) will be advanced until the vendor is directed by KDHE to discontinue drilling.

6.2.2 NO GROUNDWATER CONTAMINATION

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.

If groundwater is not encountered and drilling has been discontinued in accordance with 6.2.1, the remaining borings will be drilled to identify all potential sources of contamination, and to delineate and evaluate the degree of soil contamination. The borings will be placed to accomplish the Investigation Goals outlined in SECTION 3.3 of the Statement of Work. Only use the number of borings necessary to accomplish the investigation goals. Soil boring depth criteria for the remaining borings will be identical to the criteria established for the initial soil_boring.

6.2.3 WELL DEVELOPMENT

After a monitoring well is constructed, it is necessary to remove any debris and mud that is introduced by the drilling process, and fine particles from the immediate vicinity of the well. This process is called well development, and it serves two primary purposes:

A. Water which has been exposed to the drilling and completion process is not representative of the water in the aquifer. This water is removed, so that a more representative sample may be obtained. Drilling fluids are also removed.

B. Fine particles are removed from the formation and gravel pack in order to permit faster flow of water into the well. This permits easier purging and sampling of the well, more accurate measurement of the Static Water Level (SWL), and prevents sand from accumulating in the well screen and from entering pumps or samples.

Adequate well development requires that water in the well be violently surged or agitated and then removed. The surging loosens mud and fine sand particles outside the well screen, so that they may be removed from the well. Surging of the water may be accomplished in several ways: the water in the well may be pumped rapidly and intermittently, it may be agitated with air pressure (air lift pumping), or it may be surged by the use of a bailer or surge block. Any air lift pumping must be accomplished by use of oil-free and contaminant-free air.

Well development should also include the removal of a quantity of water equal to between 5 and 10 times the volume of the fluid column in the well (5 to 10 well volumes). The well volume is calculated by using the diameter of the borehole and the depth of static water in the well. See ATTACHMENT H for calculation of well volume.

The criteria for adequate development of a well are:

- A. The fluid flow into the well is relatively unrestricted, based on the nature of the formation. That is, the water level recovers at a characteristic rate for a particular formation following pumping or bailing of the well.
- B. The quality of water removed from the well has reached a steady state value. This may be determined of several ways:
 - the water should no longer be muddy, (alternatively, the turbidity has reached a constant value); or
 - pH, dissolved oxygen, conductivity, and temperature measurements have reached a constant value. (No more than 10% deviation for three consecutive readings.)

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. Should be equipped with a locking device to prevent tampering. Cover should provide adequate space to allow access to the well.

CONCRETE PAD

Should be a minimum of 2'x2'x4" thick to secure the protective cover, prevent pooling of water and vegetative growth around the well, and allow for placement of a surveyor pin.

IMPERVIOUS GROUT

The upper 20' of the well must be grouted with impervious grout as required by K.A.R. 28-30-2k and 6b (see next page for quotes)

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 during construction.

WELL CASING

Well casing shall terminate not less than one foot above ground surface. The following well casings are acceptable for monitoring well use.

2" I.D. PVC schedule 40 or thicker

4" I.D. PVC SDR 26 or thicker

5" I.D. PVC SDR 26 or thicker

Steel casing shall be 10 gauge or thicker

All casing materials must be connected without use of solvents, glues, or materials which would induce contamination into the well.

Some other casings are approved for well construction but are not as commonly used.

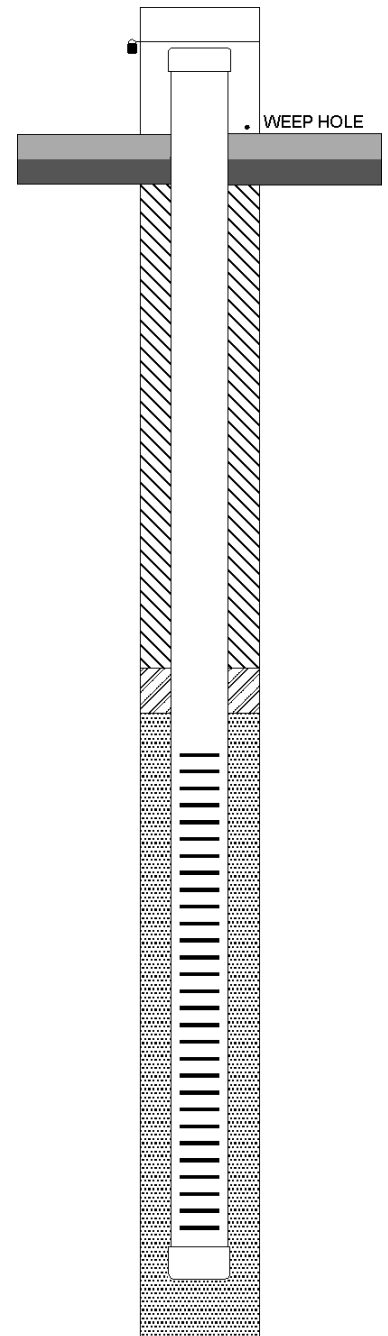
All casing materials must be selected so that incompatibility problems do not occur.

SCREEN

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

CONTRACTOR LICENSING

All monitoring wells must be constructed by a licensed water well contractor as specified under K.A.R. 28-30-3. (See next page for quotes)



K.A.R. 28-30-2 (k) Grout

Grout means cement grout, neat cement grout, bentonite clay grout or other material approved by the department 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) "Neat cement grout" means a mixture consisting of one 94 # bag of portland cement to 5-6 gallons of clean water.
- (2) "Cement grout" means a mixture consisting of one 94 # bag of portland cement to an equal volume of sand having a diameter no larger than 0.080 inches (2 millimeters) to 5-6 gallons of clean water.
- (3) "Bentonite clay grout" means a mixture consisting of water and commercial grouting or plugging sodium bentonite clay containing high solids such as that manufactured under the trade name of "volclay grout", or an equivalent as approved by the department.
 - (A) The mixture shall be as per the manufacturer's recommendations to achieve a weight of not less than 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 provided they meet the specifications listed in K.A.R. 28-30-2(k), (3), above.
 - (C) Sodium bentonite products that contain low solids, are designed for drilling purposes or that contain organic polymers shall not be used.

K.A.R. 28-30-6 (b) Grouting

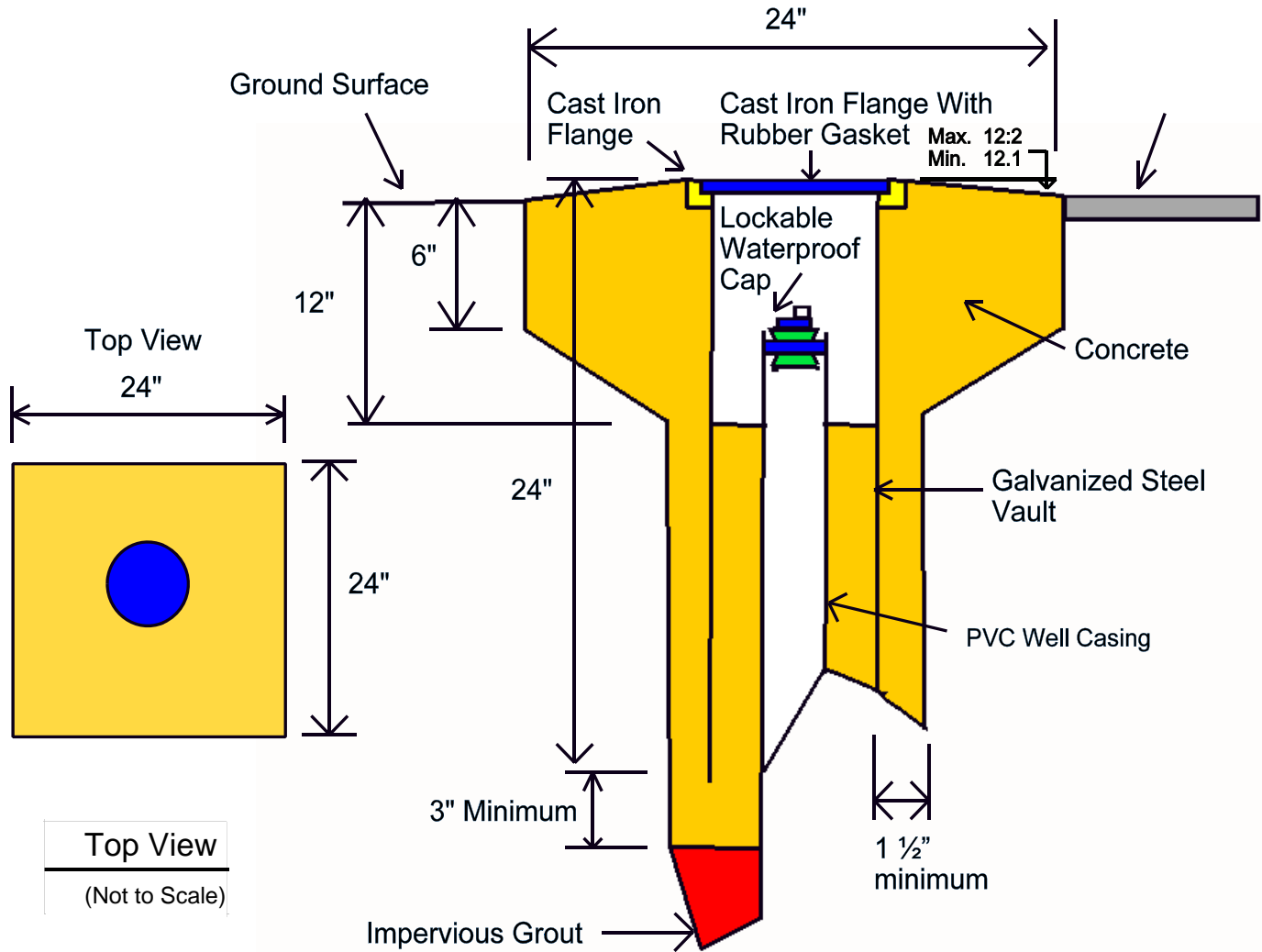
- (1) Constructed or reconstructed wells shall be sealed by grouting the annular space between the casing and the well bore from ground level to a minimum of 20 feet or to a minimum of five feet into the first clay or shale layer, if present, whichever is greater. If a pitless well adapter or unit is being installed, the grouting shall start below the junction of the pitless well adapter or unit where it attaches to the well casing and shall continue a minimum of 20 feet below this junction or to a minimum of five feet into the first clay or shale layer whichever is greater.
- (2) To facilitate grouting, the grouted interval of the well bore shall be drilled to a minimum diameter at least three inches greater than the maximum outside diameter of the well casing. If a pitless well adapter or unit is being installed on the well's casing, the well bore shall be a minimum diameter of at least three inches greater than the junction diameter of the well casing through the grouted interval below the junction of the pitless well adapter or unit where it attaches to the well casing.
 - (c) 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.

K.A.R. 28-30-3 Licensing

- (a) Eligibility. To be eligible for a water well contractor's license an applicant shall:
 - (1) Have passed an examination conducted by the department; or
 - (2) Meet the conditions contained in subsection (c).
- (b) Application fees.
 - (1) Each application shall be accompanied by an application fee of \$ 10.00.
 - (2) Before issuance of a water well contractor's license, each contractor shall pay a license fee of \$ 100.00 plus \$ 25.00 for each drill rig operated by or for the contractor. These fees shall accompany the application and shall be by bank draft, check or money order payable to the Kansas Department of Health and Environment- water well licensure.
- (c) Reciprocity.
 - (1) Upon receipt of an application and payment of the required fees from a nonresident, the secretary may issue a license, providing the nonresident holds a valid license from another state and meets the minimum requirements for licensing as prescribed in K.S.A. 82a-1207, and any amendments thereto.
 - (2) If the nonresident applicant is incorporated, evidence shall be submitted to the Department of Health and Environment showing that the applicant meets the registration requirements of Kansas Secretary of State.
 - (3) Nonresident fees for a license shall be equal to the fee charged a Kansas contractor by the applicant's state of residence but shall not be less than \$ 100.00. The application fee and drill rig license fee shall be the same as the Kansas resident fees.

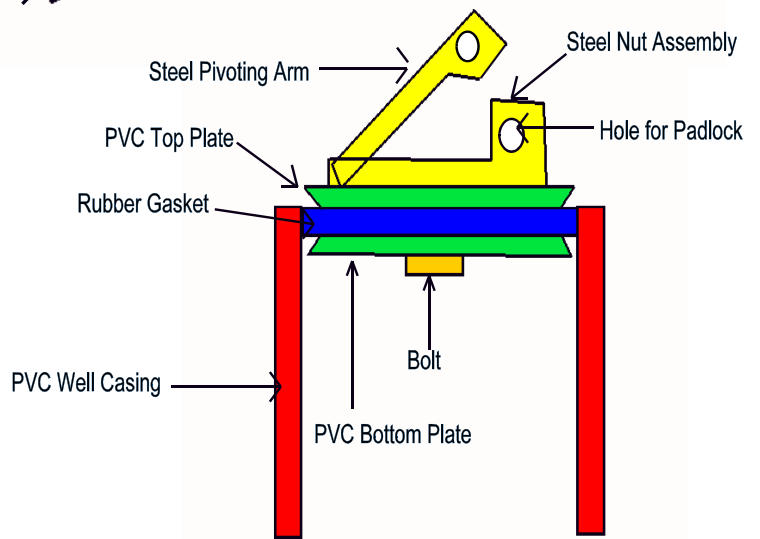
FLUSH-MOUNT WELL CONSTRUCTION DETAIL

(Not to Scale)



Top View
(Not to Scale)

Casing	2"	4"
Vault	6"	9"
Concrete Pad	24" x 24"	24" x 24"



LOCKABLE WATERPROOF CAP
(Not to Scale)

MONITORING WELL DESIGN ADDITIONAL INSTRUCTIONS

FLUSH-MOUNT WELL HEAD COMPLETION:

K.A.R. 28-30-6 (e) does not allow well casing to be terminated less than one foot above finished ground surface. Because storage tank site investigations are often conducted in areas where completing monitoring well heads above grade is not practical, consideration must be given to completing flush-mount monitoring well heads.

If monitoring well must be completed with a flush-mount well head design, a waiver of K.A.R. 28-30-6 (e) must be requested in writing. The procedures for requesting a waiver of this regulation are described as follows:

- 1) Prior to the monitoring well installation, the written request must be submitted to the address indicated below.
- 2) The request must contain the following information:
 - a. facility name and street address
 - b. legal description of the property where the wells are proposed to be located.
 - c. number of wells to be installed with flush-mount well heads
 - d. reason(s) why the regulation should be waived
 - e. approximate depth to groundwater in the local area
 - f. the general geology or lithologies expected to be encountered in drilling
 - g. specifications and/or diagrams of the vault proposed to be installed including the manufacturer's name and any other descriptive information such as a manufacturer's trade sheet.
- 3) Wait for approval of the waiver request before completing monitoring wells.
- 4) When waivers are approved and monitoring wells are installed with a flush-mount wellhead design, the well head completion must be indicated accordingly in the lithologic section of the WWC-5 water well record form. The name of the KDHE contact person that approved the waiver must also be provided in the lithologic section of the WWC-5 form.

Any waiver of regulations applies only to the wells and information indicated in the written request. A verbal request for waiver of regulations may be approved on any additional wells needed for the same area or site. The verbal request must be directed to the phone number below.

MONITORING WELL GROUTING REQUIREMENTS:

K.A.R. 28-30-6, part (b) requires that constructed or reconstructed wells be sealed by grouting the annular space between the casing and the well bore from ground level to a minimum of 20 feet or to a minimum of five feet into the first clay layer, whichever is greater. Part (c) of the same regulation specifies 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 grouping requirements are necessary solely because of shallow groundwater, a waiver or the regulations is not needed.; however, the reason for modifying the grouping requirements must be indicated accordingly on the WWC-5 water well record form. In situations where grouping modifications are required for reasons other than shallow groundwater, a waiver of K.A.R. 28-30-6(b) must be obtained following the same procedures as described for flush-mount well heads above.

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

Kansas Department of Health & Environment
Bureau of Water, Geology Section
1000 SW Jackson, Suite 420
Topeka, Kansas 66612-1367
Phone: (785)296-5522

ATTACHMENT B
SOIL BORING PLUGGING CRITERIA
K.A.R. 28-30-7(d)

ARTICLE 30 – WATER WELL CONTRACTORS 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-1202 to 82a-1215 and amendments thereto.

Kansas Administrative Regulation (K.A.R.) 28-30-7(d)(2)(A) states,

“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 or similar method.”

Refer to K.A.R. 28-30-2(k) and (t) for definition of grout and tremie pipe.

WELL PLUGGING/ABANDONEMENT REQUIREMENTS

The following requirements supplement section K.A.R. 28-30-7(d)(2)(A) 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.

ATTACHMENT C
LABORATORY METHODS

APPROVED ANALYTICAL METHODS FOR ORGANIC COMPOUNDS

ANALYTE	SOLID AND HAZARDOUS WASTE METHODS		WATER METHODS	
	No.	PARAMETER	No.	PARAMETER
Benzene	8020*	Aromatic Volatile Organics	502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
	8021*	Halogenated and Aromatic Volatiles	503.1	Volatile Aromatic & Unsat. Organic Cmp.
	8240	Volatiles	524.1	Purgeable Organic Compounds
	8260	Volatiles	524.2	Purgeable Organic Compounds
			602	Purgeable Aromatics
		624	Purgeables	
		1624	Volatile Organic Compounds	
BTEX	8020*	Aromatic Volatile Organics	502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
	8021*	Halogenated and Aromatic Volatiles	503.1	Volatile Aromatic & Unsat. Organic Cmp.
	8240	Volatiles	524.1	Purgeable Organic Compounds
	8260	Volatiles	524	Purgeable Organic Compounds
1,2-DCA	8010*	Halogenated Volatile Organics	502.1	Volatile Halogenated Organic Compounds
	8021*	Halogenated and Aromatic Volatiles	502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
	8240	Volatiles	504.1	Microextraction and GC
	8260	Volatiles	524.1	Purgeable Organic Compounds
	8261	Vaccum Distillation in Combination with GC/MS	524.2	Purgeable Organic Compounds
			601	Halogenated Volatile Organics
		624	Purgeables	
		1624	Volatile Organic Compounds	
Ethylbenzene	8020*	Aromatic Volatile Organics	502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
	8021*	Halogenated and Aromatic Volatiles	503.1	Volatile Aromatic & Unsat. Organic Cmp.
	8240	Volatiles	524.1	Purgeable Organic Compounds
	8260	Volatiles	524.2	Purgeable Organic Compounds
			602	Purgeable Aromatics
		624	Purgeables	
		1624	Volatile Organic Compounds	
MtBE	8020*	Aromatic Volatile Organics	503.1	Volatile Aromatic & Unsat. Organic Cmp.
	8240*	Halogenated and Aromatic Volatiles		
	8260	Volatiles		
Naphthalene	8021*	Halogenated and Aromatic Volatiles	502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
	8100	Polynuclear Aromatic Hydrocarbons	503.1	Volatile Aromatic & Unsat. Organic Cmp.
	8250	Semivolatile Organic Compounds	524.2	Purgeable Organic Compounds
	8270	Semivolatile Organic Compounds	550	Polycyclic Aromatic Hydrocarbons
	8310	Polynuclear Aromatic Hydrocarbons	550.1	Polycyclic Aromatic Hydrocarbons
	8260	Volatiles	610	Polynuclear Aromatic Hydrocarbons
			625	Base/Neutrals & Acids
		1625	Semivolatile Organic Compounds	
Toluene	8020*	Aromatic Volatile Organics	502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
	8021*	Halogenated and Aromatic Volatiles	503.1	Volatile Aromatic & Unsat. Organic Cmp.
	8240	Volatiles	524.1	Purgeable Organic Compounds
	8260	Volatiles	524.2	Purgeable Organic Compounds
			602	Purgeable Aromatics
			624	Purgeables
		1624	Volatile Organic Compounds	

APPROVED ANALYTICAL METHODS FOR ORGANIC COMPOUNDS

ANALYTE	SOLID AND HAZARDOUS WASTE METHODS		WATER METHODS	
	No.	PARAMETER	No.	PARAMETER
Xylene	8020*	Aromatic Volatile Organics	502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
	8021*	Halogenated and Aromatic Volatiles	503.1	Volatile Aromatic & Unsat. Organic Cmp.
	8240	Volatiles	524.1	Purgeable Organic Compounds
	8260	Volatiles	524.2	Purgeable Organic Compounds
EDB	8260	Volatiles	504.1	Microextraction and GC
	8011	Microextraction and GC with Electron Capture	555.1	Liquid-Liquid Extraction and GC with Electron Capture
	8021B	GC using Photoionization and/or Electrolytic Conductivity Detectors		
Polynuclear Aromatic Hydrocarbons	8310	Polynuclear Aromatic Hydrocarbons	610	Polynuclear Aromatic Hydrocarbons (High performance Liquid Chromatography)
	8270 SIM	Polynuclear Aromatic Hydrocarbons		
Lead	7420	AA Direct Aspiration	239.2	Atomic Absorption Spectrometry (Graphite Furnace)
	7421	Atomic Absorption, Furnace Technique	200.8	Inductively Coupled Plasma Mass Spectrometry
			200.9	Atomic Absorption Spectrometry-Stabalized Temperature (Graphite Furnace) Method

* Water samples must be prepared using method 5030 (purge & trap extraction) if this test method is used.

Air Sample Analysis:
40 CFR Ch. 1 (7-1-91 Edition) Part 60, Appendix A, Method 18 (Flexible Bag Procedure)

ATTACHMENT D
KDHE WELL TAGGING PROCEDURE

INSTRUCTIONS FOR THE KDHE/BER WELL TAG FORM

A KDHE/BER well tag record must be developed for all wells installed or/and monitored at Leaking Underground/Aboveground Storage Tank sites (including existing private or public wells). The well tag record is used to uniquely identify individual sampling points at LUST/LAST (and other) projects. To establish a well tag record, a KDHE/BER Well Tag form must be completed and a numbered tag must be permanently affixed to the well, then the form is to be returned to KDHE. Specific instructions (and exceptions) for completing the KDHE/BER Well Tag form and affixing the tag are described below.

Part I: KDHE/BER Well Tag Form

- 1) A separate KDHE/BER Well Tag form must be completed for each KDHE project code.
- 2) No two well tag numbers are the same. EACH MONITORING WELL INSTALLED MUST HAVE A UNIQUE WELL TAG NUMBER ATTACHED, additionally, GROUPS OF WELLS MAY BE ASSIGNED THE SAME PROJECT CODE.
- 3) If any existing well has already been tagged (and the tag is readable), do not tag the well again. Also see the "Caution" statement in the tag installation notes on affixing tags to existing wells.
- 4) Write the well tag number in the upper margin near the right edge of the Water Well Record form (form WWC-5) for each monitoring well installed at a LUST/LAST site.
- 5) The form must be completed according to the instructions herein. Failure to submit the forms or submitting inaccurate data could restrict or delay reimbursement for work completed. The forms must be completed and submitted to the address below within two weeks after tagging the well. Copies of the KDHE/BER Well Tag forms must be included in the appropriate appendix of the final report. Any unused well tags must be returned to the address below.

Kansas Department of Health & Environment
Bureau of Environmental Remediation
1000 SW Jackson, Suite 410
Topeka, KS 66612-1367

Part II: Affixing the Tag to a Well

The tag is made of brass and measures approximately 0.75 X 2.5 X 0.02 inches. It can be easily molded to the shape of the surface to which it will be affixed. The method of installing the tag will depend on how a well head was completed. Note the tags are provided, however, installation hardware must be supplied by the contractor. Acceptable methods of tag installation are discussed as follows:

- 1) Above-grade well head completion: For monitoring wells that have casing terminating above grade with exterior steel or PVC well head protector (standard monitoring well design), the well tag is to be installed on the exterior of the protective cover approximately 3.0 inches below the hasp used in locking the protective cover cap. The tag must be secured to the protective cover by means of two one-way metal screws or pop-rivets. Do not use adhesives to affix the tag to the protective cover.
- 2) Flush-mounted monitoring well heads: Since flush-mount manholes vary in design, there is not an entirely standard method for affixing the well tag, but, the tag must be installed inside the manhole in an area and manner leaving the tag readily visible and accessible. The tag may be affixed to the inside of the manhole cover or anchored by some means to the concrete inside the manhole. Do not use adhesives to affix the tag.
- 3) Private or public wells: The method for affixing a tag to a private or public water well must be determined according to the specific well head design, which will vary. Keep in mind the tag must remain visible and accessible after it is permanently affixed to the well. Common methods of affixing tags to these types of wells are anchoring the tag to the concrete pad at the base of the well, attaching the tag to the well house, or wiring the tag to the well casing. Remember to obtain permission prior to sampling or tagging private or public wells.

Notes on tag installation:

CAUTION! State regulations prohibit perforation of a well casing. See K.A.R. 28-30-6(e) as stated below.

K.A.R. 28-30-6(e) provides in part: "...No opening shall be made through the well casing except for the installation of a pitless adapter so designed and fabricated to prevent soil, subsurface and surface water from entering the well."

- A. Remember, the tag must be visible and must remain permanently affixed to the well sampled as part of the investigation.
- B. When affixing a tag to any well that does not have a protective casing installed, state regulations will not allow any holes to be drilled into an existing well casing. An alternative method for affixing the tag must be used.
- C. Prior to sampling or tagging any private or public water supply well, specific permission must be obtained from the appropriate authority.
- D. If there are any questions on installing the tag or completing the KDHE/BER Well Tag form, contact the KDHE project manager.

ATTACHMENT E
FIELD WORK PLAN WORKSHEET

PETROLEUM STORAGE TANK RELEASE TRUST FUND
LIMITED SITE ASSESSMENT FIELD WORKPLAN WORKSHEET

Site Name: _____ KDHE Project Code: _____
Vendor: _____ Vendor Contact: _____

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

Site Address: _____ Kansas _____
(Street) (City) (County)
Legal Description: _____ 1/4 _____ 1/4 _____ 1/4 _____ 1/4 Section _____ Township _____ Range _____ E / W

II Investigation Information

Check the general methodologies to be used: _____ Groundwater survey _____ Soil Borings _____ Monitoring Wells

List the requested information where indicated:

- 1) Groundwater Survey:
Sample Extraction Equipment _____
Sample Analysis Equipment _____

Compounds for Analysis with Detection Limits (DL)

Benzene	DL= _____ ppb	Other: _____	DL= _____ ppb
Toluene	DL= _____ ppb	_____	DL= _____ ppb
Ethylbenzene	DL= _____ ppb	_____	DL= _____ ppb
Xylenes	DL= _____ ppb	_____	DL= _____ ppb

- 2) Drilling: (list primary equipment under column "A", under column "B", list drilling equipment to be used if auger refusal is encountered)

	A	B
Drill Rig	Brand/Model _____	_____
	Torque Rating _____	_____
Drill String	Type (Augers, etc) _____	_____
	O.D. / I.D. _____	_____
Borehole Size	_____	_____
Sample Collection Equip	_____	NA
Drilling Sample Frequency	_____	NA

- 3) Field Screening Instrument
Device (Brand / Type / Spec) _____
Calibration Standard _____
Calibration Frequency _____

- 4) Monitoring Well Development
Method (bailer, pump, etc) _____
Minimum well volume to be with drawn (Drilling Scenario "A") _____
Minimum well volume to be with drawn (Drilling Scenario "B") _____

5) Hydrogeologic Testing Methods: (list test method & number of tests)

Unsaturated Zone	Permeability	_____	Number of tests	_____
	Dry Bulk Density	_____	Number of tests	_____
	Organic Matter/Carbon	_____	Number of tests	_____
	Water Content (gravimetric)	_____	Number of tests	_____
Saturated Zone	Permeability	_____	Number of tests	_____

6) Laboratory Analytical:

Soil Samples	Collection Equipment	_____
	Analytical Methods	_____
Water Samples	Collection Equipment	_____
	Analytical Methods	_____
	Laboratory to Conduct Analysis	_____

7) Waste Handling Procedures - Briefly describe how soil and water waste will be handled, treated, or disposed of:

Soil _____
Water _____

8) 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 **three site maps**. The first site map will be a detailed site map with a scale such that 1" = 50' for smaller sites and 1" = 100' for larger sites. The second site map will depict the site including a minimum 350' radius from the release with an approximate scale of in 1" = 100'. The third site map will depict the site including a minimum 500' radius from the release with an approximate scale of 1"=100'. All three maps must contain the following
 - 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 or 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 If a Geoprobe Survey is requested: Proposed probe locations as listed on the SSI sheet. Probe locations must be numbered. Include existing wells within 350' from the source. All wells should be designated in accordance with previous reports if available.
 - H Accessible easements within the specified area.
 - I Arrow depicting groundwater flow direction.
 - J Site name and KDHE Project Code.
- 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 4.2.1 under Section 4.0, Deliverables in the LSA RFP.
- 5) Site conceptual exposure model

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 1.3 of the LSA RFP Rev. 11 (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.

Name	Position Title	Name	Position Title
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Indicate whether a Health and Safety Plan has been prepared for this investigation: Yes _____ No _____

Site visit conducted by: _____ Work plan preparation completed by: _____

ATTACHMENT F
TIME SHEETS

**KDHE TRUST FUND TIME SHEET LOG
FOR FIELD ACTIVITIES**

SITE NAME: _____
SITE ADDRESS: _____
KDHE SITE CODE: _____
CONSULTANT: _____
PROJECT MANAGER: _____

NOTE: This form is to be maintained during all field activities. All Workers must sign, date and list the time they arrive and depart from the site. This must be done each time a worker arrives or departs the site. A COPY OF THIS FORM MUST ACCOMPANY ALL REQUESTS FOR REIMBURSEMENT.

DATE	PRINT WORKERS NAME	WORKER'S SIGNATURE	JOB TITLE	TIME STARTED	TIME FINISHED	TOTAL TIME FOR DAY

I certify that the names and signatures above are those of the actual people who worked on the referenced site during the dates and times stated.

Signed: _____
 Consultant Project Manager

Date: _____

I certify that the information on this sheet is true and accurate to the best of my knowledge.

Signed: _____
 Owner/Operator or Authorized Representative

Date: _____

ATTACHMENT G
OWNER/OPERATOR STANDARD CONTRACT

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 H
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:

$$\text{WBSV (gallons)} = \pi(r_1)^2h_1 + 0.25 (\pi(r_2)^2h_2 - \pi(r_1)^2h_2)$$

Where: π (pi) = 3.1416
 r_1 = radius of well casing/screen
 h_1 = TD minus DTW
 r_2 = radius of borehole
 h_2 = TD minus Depth to Top of Filter Pack
 0.25 = assumed porosity of Filter Pack
 r_1, h_1, r_2, h_2 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%

$$\text{WBSV (gallons)} = \pi(r_1)^2h_1 + 0.25 (\pi(r_2)^2h_2 - \pi(r_1)^2h_2)$$

$$\begin{aligned} \text{WBSV} &= 3.1416 (1")^2(240") + .025[3.1416(4")^2(180") - 3.1416(1")^2(180")] \\ &= 753.984 + .025[9047.808 - 565.488] \\ &= 753.984 + .025[8482.32] \\ &= 2874.564 \text{ in}^3 / 1728 \text{ in}^3/\text{ft}^3 \\ &= 1.644 \text{ ft}^3 \times 7.4809 \text{ gallons}/\text{ft}^3 \\ &= 12.45 \text{ gallons} \end{aligned}$$

Where: $\text{ft}^3 = 1728 \text{ in}^3$ and $\text{ft}^3 = 7.4809 \text{ gallons}$

VOLUME OF WATER IN CASING OR HOLE

Diameter of Casing or Hole (in)	Gallons per foot of Depth	Cubic Feet per Foot of Depth	Liters per Meter of Depth	Cubic Meters per Meter of Depth
1	0.041	0.006	0.509	0.509×10^{-3}
1 1/2	0.092	0.012	1.142	1.142×10^{-3}
2	0.163	0.022	2.024	2.024×10^{-3}
2 1/2	0.255	0.034	3.167	3.167×10^{-3}
3	0.367	0.049	4.558	4.558×10^{-3}
3 1/2	0.500	0.067	6.209	6.209×10^{-3}
4	0.653	0.087	8.110	8.110×10^{-3}
4 1/2	0.833	0.110	10.26	10.26×10^{-3}
5	1.020	0.136	12.67	12.67×10^{-3}
5 1/2	1.234	0.165	15.33	15.33×10^{-3}
6	1.469	0.196	18.24	18.24×10^{-3}
7	2.000	0.267	24.84	24.84×10^{-3}
8	2.611	0.349	32.43	32.43×10^{-3}
9	3.305	0.442	41.04	41.04×10^{-3}
10	4.080	0.545	50.67	50.67×10^{-3}
11	4.937	0.660	61.31	61.31×10^{-3}
12	5.875	0.785	72.96	72.96×10^{-3}
14	8.000	1.069	99.35	99.35×10^{-3}
16	10.440	1.396	129.65	129.65×10^{-3}
18	13.220	1.767	164.18	164.18×10^{-3}
20	16.320	2.182	202.68	202.68×10^{-3}
22	19.750	2.640	245.28	245.28×10^{-3}
24	23.500	3.142	291.85	291.85×10^{-3}
26	27.580	3.687	342.52	342.52×10^{-3}
28	32.000	4.276	397.41	397.41×10^{-3}
30	36.720	4.909	456.02	456.02×10^{-3}
32	41.780	5.585	518.87	518.87×10^{-3}
34	47.160	6.305	585.68	585.68×10^{-3}
36	52.880	7.069	656.72	656.72×10^{-3}

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 = 12.419×10^{-3} cubic meters per meter of depth

ATTACHMENT I
DOMESTIC WELL CONTACT FORM

ATTACHMENT J
FIELD WORK NOTIFICATION FORM

LSA FIELD WORK NOTIFICATION FORM - Mail, fax, or e-mail to the KDHE Project Manager and the KDHE District Office seven days prior to field work. District number follows the "U" or "A" in the project code. Circle the district office.

KDHE / BER / STORAGE TANK SECTION

1000 SW Jackson, Suite 410
Topeka, KS 66612
FAX: (785) 296-6190

KDHE SWDO #1
Attn.: Kevin Faurot
302 W. McArtor Road
Dodge City, KS 67801
FAX: (620) 225-3731

KDHE SCDO #2
Attn.: Kyle Parker
130 South Market, 6th Floor
Wichita, KS 67202
FAX: (316) 337-6023

KDHE SEDO #3
Attn.: Renee Brown
1500 West 7th
Chanute, KS 66720
FAX: (620) 431-1211

KDHE NEDO #4
Attn.: Dan Kellerman
800 West 24th Street
Lawrence, KS 66046
FAX: (785) 842-3537

KDHE NCDO #5
Attn.: Scott Lang
2501 Market Place, Suite D&E
Salina, KS 67401
FAX: (785) 827-1544

KDHE NWDO #6
Attn.: Bill Heimann
2301 E. 13th
Hays, KS 67601
FAX: (785) 625-4005

KDHE and KDHE DISTRICT OFFICE NOTIFICATION OF PLANNED FIELD ACTIVITIES

DATE: _____

KDHE Project Manager: _____

Site Name: _____ **Project Code:** _____

Address: _____ **City:** _____ **County:** _____

Consultant: _____
(company name, personnel expected)

Planned Date(s) of Activity(ies): _____

COMMENTS:

