Request for Bid

Fixed-Price Bid to Result

Site Remediation through Closure
Site Specific Standard

Solicitor

Herr Foods, Inc.

20 Herr Drive
Nottingham, Chester County, PA 19362

PADEP Facility ID #: 15-24418 PAUSTIF Claim #: 19970175(F)

Date of Issuance

January 24, 2019

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The Pennsylvania Underground Storage Tank Indemnification Fund (PAUSTIF), on behalf of the Claimant who hereafter is referred to as the Client or Solicitor, is providing this Request for Bid (RFB) to prepare and submit a bid to complete the Scope of Work (SOW) for the referenced Site. The Solicitor is the owner / operator of the Site. PAUSTIF has determined that the claim reported by the Solicitor is eligible for coverage from the PAUSTIF subject to the applicable statutes and regulations. Reimbursement of Solicitor-approved reasonable and necessary costs, not to exceed the claim aggregate limit, for the corrective action work described in this RFB will be provided by PAUSTIF. Solicitor is responsible to pay any applicable deductible and/or proration.

Each bid response will be considered individually and consistent with the evaluation process described in the PAUSTIF Competitive Bidding Fact Sheet which can be downloaded from the PAUSTIF website https://ustif.pa.gov.

Calendar of Events

Activity	Date and Time
Notification of Intent to Attend Site Visit	**February 4, 2019 by 5:00 p.m.**
Mandatory Pre-Bid Site Visit	**February 7, 2019 at 1:00 p.m.**
Deadline to Submit Questions	**March 6, 2019 by 5 p.m.**
Bid Due Date and Time	**March 13, 2019 by 3 p.m.**

Contact Information

Technical Contact
Mr. Robert Breakwell, P.G. **Excalibur Group, LLC** **1193 State Road** **Monessen, PA 15062** **rbreakwell@excaliburgrpllc.com**

All questions regarding this RFB and the subject Site conditions must be directed via email to the Technical Contact identified above with the understanding that all questions and answers will be provided to all bidders. The email subject line must be **"Herr Foods, Claim #19970175(F) – RFB QUESTION".** Bidders must neither contact nor discuss this RFB with the Solicitor, PAUSTIF, the Pennsylvania Department of Environmental Protection (PADEP), or ICF unless approved by the Technical Contact. Bidders may discuss this RFB with subcontractors and vendors to the extent required for preparing the bid response.

Requirements

Mandatory Pre-Bid Site Meeting

The Solicitor, the Technical Contact, or their designee will hold a mandatory Site visit on the date and time listed in the Calendar of Events to conduct a Site tour for one (1) participant per bidding company. The Technical Contact will collect questions and respond via email. All questions and answers will be provided via email to all attendees. This meeting is mandatory for all bidders, no exceptions. This meeting will allow each bidding company to inspect the Site and evaluate Site conditions. **A notice of the bidder's intent to attend this meeting is requested to be provided to the Technical Contact via email by the date listed in the Calendar of Events with the subject "Herr Foods, Claim #19970175(F) – SITE MEETING ATTENDANCE NOTIFICATION".** The name and contact information of the company participant should be included in the body of the email. Notification of intent to attend is appreciated; however, it is not required. Attendance at the Pre-Bid Site Meeting is mandatory. Changes to the Site meeting date and/or time due to inclement weather conditions or other unexpected circumstances will be posted at https://ustif.pa.gov/bids; and, the Technical Contact may notify via email all companies that provided Site Meeting Attendance Notification.

Submission of Bids

To be considered for selection, **one (1) hard copy of the signed bid package and one (1) electronic copy (one (1) PDF file on a compact disk (CD) included with the hard copy) must be provided directly to the PAUSTIF's third party administrator, ICF, to the attention of the Contracts Administrator.** The Contracts Administrator will be responsible for opening the bids and providing copies to the Technical Contact and the Solicitor. Bid responses will only be accepted from those companies that attended the Mandatory Pre-Bid Site Meeting. **The ground address for overnight/next-day deliveries is ICF, 4000 Vine Street, Middletown, PA 17057, Attention: Contracts Administrator. The outside of the shipping package containing the bid must be clearly marked and labeled with "Bid – Claim #1997-0175(F)".** Please note that the use of U.S. Mail, FedEx, UPS, or other delivery method does not guarantee delivery to this address by the due date and time listed in the Calendar of Events for submission. Companies mailing bids should allow adequate delivery time to ensure timely receipt of their bid.

The bid must be received by 3 p.m. on the due date shown in the Calendar of Events. Bids will be opened immediately after the 3 p.m. deadline on the due date. Any bids received after this due date and time will be time-stamped and returned. If, due to inclement weather, natural disaster, or any other cause, the PAUSTIF's third party administrator, ICF's office is closed on the bid due date, the deadline for submission will automatically be extended to the next business day on which the office is open. The PAUSTIF's third party administrator, ICF, may notify all companies that attended the Mandatory Pre-Bid Site Meeting of an extended due

date. The hour for submission of bids shall remain the same. Submitted bid responses are subject to the Pennsylvania Right-to-Know Law.

Bid Requirements

The Solicitor wishes to execute a mutually agreeable contract with the selected consultant ("Remediation Agreement"). The Remediation Agreement is included as Attachment 1 to this RFB. The bidder must identify and document in their bid any modifications that they wish to propose to the Remediation Agreement language in Attachment 1 other than obvious modifications to fit this RFB (e.g., names, dates, and descriptions of milestones). The number and scope of any modifications to the standard agreement language will be one of the criteria used to evaluate the bid. **Any bid that does not clearly and unambiguously state whether the bidder accepts the Remediation Agreement language in Attachment 1 "as is", or that does not provide a cross-referenced list of requested changes to this agreement, will be considered non-responsive.** This statement should be made in a Section in the bid entitled "Remediation Agreement". Any proposed changes to the agreement should be specified in the bid; however, these changes will need to be reviewed and agreed upon by both the Solicitor and the PAUSTIF.

The selected consultant will be provided an electronic copy (template) of the draft Remediation Agreement in Microsoft Word format to allow agreement-specific information to be added. The selected consultant shall complete the agreement-specific portions of the draft Remediation Agreement and return the document to the Technical Contact within 10 business days from date of receipt.

The Remediation Agreement fixed costs shall be based on unit prices for labor, equipment, materials, subcontractors/vendors, and other direct costs. The total cost quoted in the bid by the selected consultant will be the maximum amount to be paid by the Solicitor unless a change in scope is authorized and determined to be reasonable and necessary. There may be deviations from and modifications to this SOW during the project. The Remediation Agreement states that any significant changes to the SOW will require approval by the Solicitor, PAUSTIF, and PADEP. NOTE: Any request for PAUSTIF reimbursement of the reasonable costs to repair or replace a well will be considered on a case-by-case basis.

The bidder shall provide its bid cost using the Bid Cost Spreadsheet (included as Attachment 2) with descriptions for each task provided in the body of the bid document. Please note, if costs are provided within the text of the submitted bid and there is a discrepancy between costs listed in the Bid Cost Spreadsheet and in the text, the costs listed within the Bid Cost Spreadsheet will be used in the evaluation of the bid and in the Remediation Agreement with the selected consultant. Bidders are responsible to ensure spreadsheet calculations are accurate. The technical score for bids will be based solely on those tasks represented as milestones included in the Bid Cost Spreadsheet and the total bid cost. Any optional bidder-defined tasks,

milestones, or cost adders that are not requested as part of this RFB will not be considered by the Bid Evaluation Committee in the technical review and technical score for the bid.

In addition, the bidder shall provide:

1. The bid unit cost rates for each expected labor category, subcontractors, other direct costs, and equipment;

2. The bid markup on other direct costs and subcontractors (if any);

3. The bid total cost by task consistent with the proposed SOW identifying all level-of-effort and costing assumptions; and

4. The bid unit rate schedule that will be used for any out of scope work on this project.

Each bid will be assumed to be valid for a period of up to 120 days after receipt unless otherwise noted. The costs quoted in the Bid Cost Spreadsheet will be assumed to be valid for the duration of the Remediation Agreement.

Please note that the total fixed-price bid must include all costs, including those cost items that the bidder may regard as "variable". These variable cost items will not be handled outside of the total fixed-price quoted for the SOW unless the RFB requests costing alternatives for specific items or services. Any bid that disregards this requirement will be considered non-responsive to the bid requirements and, as a result, will be rejected and will not be evaluated.

The RFB is requesting a total fixed-price bid (unless the RFB requests costing alternatives for specific items or services). PAUSTIF will not agree to assumptions (in bids or the selected bidders executed Remediation Agreement) referencing a level of effort and/or hours. Costs provided in your bid should be developed using your professional opinion, experience, and the data provided. PAUSTIF will not reimburse costs for additional hours to complete activities included as part of the base bid/contract price.

Each bid response document must include at least the following:

1. Demonstration of the bidder's understanding of the Site information provided in this RFB, standard industry practices, and objectives of the project.

2. A clear description, specific details, and the bidder's own language of how the proposed work scope will be completed for each milestone. The bid should specifically discuss all tasks that will be completed under the Remediation Agreement and what is included (e.g., explain groundwater purging/sampling methods, which guidance documents will be followed, what will be completed as part of the Site specific work scope/SCR/RAP

implementation). Recommendations for changes/additions to the Scope of Work proposed in this RFB shall be discussed, quantified, and priced separately; however, failure to bid the SOW "as is" may result in a bid not being considered. Bids should include enough original language conveying bidder's thought such that the understanding of site conditions, closure approach (if applicable), and approach to addressing the scope of work can be evaluated. Since bidders are not prequalified, the bid response must provide the Bid Evaluation Committee and Solicitor enough information to complete a thorough review of the bid and bidder.

3. A copy of an insurance certificate that shows the bidder's level of insurance consistent with the requirements of the Remediation Agreement. Note: The selected consultant shall submit evidence to the Solicitor before beginning work that they have procured and will maintain Workers Compensation, commercial general and contractual liability, commercial automobile liability, and professional liability insurance commensurate with the level stated in the Remediation Agreement and for the work to be performed.

4. The names and brief resumes/qualifications of the proposed project team including the proposed Professional Geologist and Professional Engineer (if applicable) who will be responsible for overseeing the work and applying a professional seal to the project deliverables (including any major subcontractor(s)).

5. Responses to the following specific questions:

    a. Does your company employ a Pennsylvania-licensed Professional Geologist or Professional Engineer that is designated as the proposed project manager? How many years of experience does this person have?
    b. How many Pennsylvania Chapter 245 projects is your company currently the consultant for in the PADEP Region where the Site is located? Please list up to 10.
    c. How many Pennsylvania Chapter 245 Corrective Action projects involving an approved SCR, RAP, and RACR has your company and/or the Pennsylvania-licensed Professional Geologist or Professional Engineer closed (i.e., obtained Relief of Liability from the PADEP) using any standard?
    d. Has your firm ever been a party to a terminated PAUSTIF-funded Fixed-Price (FP) or Pay-for-Performance (PFP) contract without attaining all of the milestones? If so, please explain.

6. A description of subcontractor involvement by task. Identify and describe the involvement and provide actual cost quotations/bids/proposals from all significant specialized subcontracted service (e.g., drilling/well installations, laboratory, etc.). If a bidder chooses to prepare its bid without securing bids for specialty subcontract

services, it does so at its own risk. Added costs resulting from bid errors, omissions, or faulty assumptions will not be considered for PAUSTIF reimbursement.

7. A detailed schedule of activities for completing the proposed SOW including reasonable assumptions regarding the timing and duration of Solicitor reviews (if any) needed to complete the SOW. Each bid must provide a schedule that begins with execution of the Remediation Agreement with the Solicitor and ends with completion of the final milestone proposed in this RFB. Schedules must also indicate the approximate start and end date of each of the tasks/milestones specified in the Scope of Work, and indicate the timing of all proposed key milestone activities (e.g., within 30 days of the contract being executed).

8. A description of how the Solicitor, ICF, and the PAUSTIF will be kept informed as to project progress and developments and how the Solicitor (or designee) will be informed of and participate in evaluating technical issues that may arise during this project.

9. A description of your approach to working with the PADEP. Describe how the PADEP would be involved proactively in the resolution of technical issues and how the PADEP case team will be kept informed of activities at the Site.

10. Key exceptions, assumptions, or special conditions applicable to the proposed SOW and/or used in formulating the proposed cost estimate. Please note that referencing extremely narrow or unreasonable assumptions, special conditions, and exceptions may result in the bid response being deemed “unresponsive”.

11. The name and contact information of the person who is to be contacted in the event the bid is selected by the Solicitor and/or a Right to Know request is received by PAUSTIF.

Bid Review and Evaluation

1. Bid Review and Scoring

   Bidders' submissions that are administratively qualified (i.e., attended the mandatory pre-bid site meeting and submitted the bid in strict accordance with instructions by the designated due date and time) will be evaluated.

   Technical Scoring

   Bids are evaluated for technical viability before bid cost is considered. Bids that have technical scores that fall within 75% of the highest technical score will advance to cost scoring. Bids with technical scores below 75% of the highest technical score are eliminated from further consideration.

   Numerical values will be assigned to each of three categories to derive the technical score for this bid-to-result solicitation:

   - Problem Understanding
   - Technical and Regulatory Approach to Remediation
   - Qualifications and Experience

   Cost Scoring

   Cost scores are determined by a cost formula. The bid(s) with the lowest total cost receives the maximum cost points available. The remaining bids are scored by applying the following cost formula: (1-((B-A)/A)) x C = D

   A = the lowest bid cost
   B = the bidder's cost being scored
   C = the maximum number of cost points available
   D = bidder's cost score (points)

   If a bid cost is equal to, or greater than, twice the amount of the lowest bid cost, the formula calculation will result in a negative number and the bid will be assigned zero cost points.

2. Evaluation of Bids

   A committee comprised of at least two members of the USTIF staff, two members of ICF staff, and the TPR who assisted in developing the bid package will score all bids that are administratively qualified based on the above criteria. USTIF recognizes that several bids may be acceptable and receive similar numerical scores. At the conclusion of the

scoring process, Solicitor will receive those bids with numerical scores placing them in the category of meeting Reasonable and Necessary criteria and acceptable for USTIF funding. Solicitor may select any of the consulting firms that submitted a qualified bid package to implement the tasks described in the bid; however, USTIF will only provide funding up to the highest fixed price of those bids determined to be Reasonable and Necessary for USTIF funding.

General Site Background and Description

Each bidder should carefully review the existing information and documentation provided in Attachment 3. The information and documentation has not been independently verified. Bidders may wish to seek out other appropriate sources of information and documentation specific to this Site. If there is any conflict between the general Site background and description provided herein and the source documents within Attachment 3, the bidder should defer to the source documents.

Summary of Site Background and Features

The Herr Foods, Inc. (HFI) processing facility is located at 273 Old Baltimore Pike in West Nottingham Township, Chester County, PA 19362, and has historically supported snack food manufacturing operations. The HFI facility covers several tax parcels on which the main production buildings (Plant 1 and Plant 2) and support buildings are located (see Figure 1 in Attachment 3a). The area of environmental concern ("Site") is located in the southern portion of the HFI facility where petroleum release(s) occurred from former underground storage tank (UST) / dispensing systems operated by the truck maintenance garage. Details regarding Site environmental features, previous subsurface investigations and prior remedial actions are provided in the sections below.

In general, land use in the vicinity of the HFI facility consists primarily of residential properties and agricultural, undeveloped and wooded parcels with some light commercial and institutional properties. A railroad corridor also extends across the eastern portion of the Site. Buried utilities in the vicinity of the truck garage include, but may not be limited to, water, electric, cable, telephone, and a sewer line extending from the southeast corner of the garage building to a septic tank. Also, a rip-rap culvert is present in the eastern portion of the Site that appears to convey storm water runoff from the asphalt parking lot to the wetlands / stream. The aerial photograph provided in Figure 1 of Attachment 3a depicts the location of the truck garage / Site in relation to the HFI facility and surrounding parcels. Relevant Site environmental features including subsurface utilities are shown in Figure 2 of Attachment 3a.

The truck maintenance garage is used to service and fuel the HFI fleet vehicles and currently operates two 10,000-gallon USTs located in a common cavity west of the garage building. One of the USTs contains unleaded gasoline and the other contains diesel fuel. The current USTs are positioned beneath the dispensing canopy, between the two fuel dispenser islands and the same area where the prior generation of USTs leaked (the subject of this RFB).

The truck garage formerly obtained potable water from a supply well located beyond the northeast corner of the garage building. This water supply well was decommissioned in the

spring of 2018. The truck garage is currently connected to an off-property water supply well operated by HFI.

The area surrounding the north, west and south sides of the truck garage building is paved with asphalt and is used for parking fleet vehicles. Investigation results reveal soil and groundwater contamination predominantly resides to the north and east of the building but with some impacts clearly beneath at least a portion of the building footprint. Beyond the east side of the building is a grass covered field and wooded land which extends to a wetlands area and stream. The stream in this unpaved area east of the truck garage is driving the SSS numerical goals and cleanup since human health exposures can be eliminated via engineering and institutional controls everywhere else.

Historical Petroleum Storage and Dispensing Operations, Release History and UST System Closures

Five USTs (#003 through #007) were decommissioned and removed from the HFI property during the period between May 28 and June 4, 1997. USTs #003 through #006 were just west of the truck garage building and UST #007 was located at the southern side of the building (see Figure 2 in Attachment 3a). The capacity and contents of these removed USTs were as follows:

UST #003: 4,000-gallons / new motor oil
UST #004: 4,000-gallons / unleaded gasoline
UST #005: 15,000-gallons / unleaded gasoline
UST #006: 12,000-gallons / diesel fuel
UST #007: 1,000-gallons / used motor oil

The five decommissioned USTs were replaced with two 10,000-gallon tanks, also located west of the garage building, that are currently in service for the storage of unleaded gasoline and diesel fuel.

During the UST closure activities, petroleum impacted soil was encountered and partially removed via excavation. The July 1997 UST Closure Report (Attachment 3b) indicates that perforations were present in the bottoms of USTs #005 and #006 and that the product piping associated with these USTs was “suspect” with respect to integrity at the piping unions and connections beneath the dispensers. The report also indicated that obvious localized soil impacts were observed at the locations of USTs #004, #005 and #006. USTs #003 and #007 appeared to have been structurally intact and no obvious soil contamination was noted at these tank locations.

Petroleum-impacted soil was excavated to a distance of approximately two feet from USTs #004, #005 and #006. A total of approximately 1,200 tons of petroleum-impacted soil were excavated and transported off-site for disposal. Laboratory analytical results from the post-

excavation UST closure soil samples revealed concentrations of MTBE above the applicable PADEP Act 2 standard only for the samples collected from the UST #004 excavation cavity and from below the eastern dispenser island.[1] In correspondence issued by the PADEP in November 1997, the Department indicated that it accepted the UST Closure Report and that "…no further action is required regarding the closure of the tanks".

In October 2014, due diligence activities (i.e., Phase I and II Environmental Site Assessments [ESA]) led to the discovery of petroleum impacted soil believed to be related to the historical UST operations at the truck garage. HFI subsequently retained RETTEW Associates, Inc. (RETTEW) to perform site characterization which was completed in several phases between February 2015 and April 2016. The methods and results from RETTEW's site characterization efforts were documented in its June 2016 Revised Site Characterization Report (RSCR) provided in Attachment 3c. Supplemental site characterization activities were conducted during July and August 2016 to address data gaps and refine the proposed *in-situ* chemical oxidation (ISCO) remedial approach.

In March 2017, RETTEW submitted a Remedial Action Plan (RAP) to the PADEP for review and approval. The proposed RAP remedial approach involved the application of a chemical oxidant (i.e., ISCO) delivered via direct-push injection points.[2] A copy of the RAP is provided in Attachment 3d. The RAP was unconditionally approved in a PADEP letter dated June 14, 2017 (Attachment 3e). RETTEW implemented the ISCO injections per the PADEP-approved RAP during the Spring of 2018 with only limited success. The ISCO remedial approach and implementation efforts are summarized in a later section of this RFB.

Overview of Site Characterization Activities and Results

Phase I and Phase II Environmental Site Assessments

Phase I and II ESAs were conducted at the HFI facility between April and October 2014 to satisfy environmental due diligence as part of a loan application package. The Phase I ESA identified several recognized environmental conditions (RECs) in the truck garage including several trench-style floor drains, which discharge to the septic drain field located southeast of the garage building, and five subgrade hydraulic lifts. The Phase II ESA was intended to investigate soil quality at each REC.

In October 2016, five soil borings (SB-6 through SB-10) were advanced adjacent to, and within the general vicinity of the truck garage to investigate soil quality near the hydraulic lifts, floor drains and septic drain field. Soil sample analytical results indicated that benzene,

[1] Confirmatory soil samples exceeding the applicable PADEP Act 2 standard for MTBE were collected at depths ranging from 9 to 12 ft-bg.
[2] The RAP also discussed and provided results from the July and August 2016 supplemental site characterization activities.

ethylbenzene, naphthalene and toluene were detected in samples collected from borings SB-7 (8 feet below grade [ft-bg]) and SB-8 (7 ft-bg) at concentrations exceeding their PADEP Act 2 non-residential Statewide Health Standards (SHS) for saturated soil. Soil borings SB-7 and SB-8 were located along the northern side of the truck garage and hydraulically downgradient from the UST field suggesting that the leaking USTs and piping formerly removed could be the source, or contributing source, for the soil contamination observed during the Phase II ESA. A copy of the Phase II ESA report is provided in Attachment 3f.

Site Geology, Hydrogeology and Hydrology

The Site geology has generally been described as consisting of residual saprolitic soil derived from weathering of the underlying schist and gneiss bedrock. The soil profile is described as a mixture of micaceous silt and sand underlain by completely decomposed schist and gneiss bedrock. A surficial deposit of clay to silty and sandy clay is reportedly present to depths ranging from approximately 3 to 7 ft-bg at a limited number of boring locations across the Site. Weathered bedrock (described as "semi-competent") was reportedly encountered in numerous borings at depths ranging from approximately 14 to 19 ft-bg. Drilling logs are provided in the June 2016 RSCR (Attachment 3c) and March 2017 RAP (Attachment 3d). Soil boring and monitoring well locations are depicted on Figure 3 provided in Attachment 3a.

Hydrogeologic data for the Site has been provided through depth to groundwater gauging and aquifer testing within a network of monitoring wells. The depth to the shallow unconfined water table aquifer beneath the Site has historically ranged from approximately 0.2 (MW-11) to 7.6 (MW-4) ft-bg with an overall site-wide average of about 4.4 ft-bg. Historical groundwater gauging data is tabulated in the most recent third quarter 2018 Remedial Action Progress Report (RAPR) provided in Attachment 3g. Groundwater flow in the water table aquifer appears to be toward the east to southeast in the general direction of the wetlands area and unnamed tributary to North East Creek.[3] The average horizontal hydraulic gradient appears to be on the order of approximately 0.02 ft/ft. Site groundwater likely discharges to the wetlands area which forms the headwater of the creek. The wetlands / creek headwater area is located approximately 300 feet east of the truck garage.

Three short-duration constant-rate groundwater pumping tests were performed at wells MW-3, MW-5 and MW-7 to estimate hydraulic characteristics for the shallow water table aquifer. The duration of each test was approximately 40 minutes at constant pumping rates ranging from about 0.6 (MW-7) to 0.9 GPM (MW-3 and MW-5). Hydraulic conductivity / transmissivity values estimated from the testing were 0.37 ft/day / 23 ft^2/day (MW-3), 0.45 ft/day / 28 ft^2/day (MW-5) and 0.14 ft/day / 8.7 ft^2/day (MW-7).

[3] The unnamed tributary to North East Creek is classified as an intermittent stream according to the USGS National Hydrography Dataset.

Soil Quality

Soil Borings

A total of 39 soil samples obtained from 20 soil borings (SB-11 through SB-30) were submitted for laboratory analysis during the various phases of site characterization. Soil samples were analyzed according to the current (most up to date) PADEP short-lists for unleaded gasoline and diesel fuel compounds. Based on the sample collection depths and historical depth to groundwater gauging data, it appears that the vast majority (~90%) of soil samples were obtained from permanently saturated soil (zone of permanent saturation) and therefore would not be reflective of the unsaturated / periodically saturated soil which PADEP uses to determine where soil remediation is required and when attainment of the soil standards has been met.

The historical analytical dataset (saturated, periodically saturated and unsaturated soil) reveals that the primary constituents of concern (COCs) in site soil appear to be benzene and 1,2,4-trimethylbenzene (TMB) and, to a lesser extent, ethylbenzene, naphthalene and toluene. Soil impacts exceeding the PADEP Act 2 non-residential SHS MSCs were identified in soil samples collected from borings completed adjacent to and slightly beyond the northern wall of the truck garage and north of the UST / dispenser pad area. Samples collected from two borings completed beneath the floor of the truck garage also contained petroleum impacts exceeding the applicable standard.

Maximum concentrations for the COCs identified in soil were reported at the following locations and depths:

- benzene: 22,000 micrograms per kilogram (ug/kg); soil boring SB-7 advanced adjacent to northern wall of truck garage; sample collected at ~8 ft-bg (permanently saturated soil).
- 1,2,4-TMB: 120,000 ug/kg; soil boring SB-12 advanced beyond northern perimeter of UST / dispenser area; sample collected at ~8 ft-bg (permanently saturated soil).
- naphthalene: 30,000 ug/kg; soil boring SB-8 advanced adjacent to northern wall of truck garage; sample collected at ~7 ft-bg (periodically saturated soil).
- ethylbenzene: 130,000 ug/kg; soil boring SB-17 advanced near northwest corner of truck garage; sample collected at ~11 ft-bg (permanently saturated soil).
- toluene: 450,000 ug/kg; soil boring SB-8 advanced adjacent to northern wall of truck garage; sample collected at ~7 ft-bg (periodically saturated soil).

Historical soil sampling locations and analytical results are contained in the June 2016 RSCR (Attachment 3c) and March 2017 RAP (Attachment 3d).

Membrane Interface Probe Survey

A membrane interface probe (MIP) survey was conducted in July 2016 to provide high-resolution, real-time data for delineating volatile organic compounds in soil and groundwater to refine the proposed ISCO site remedy and better target subsurface impacts. A total of 10 MIP borings were advanced to depths ranging from approximately 12 to 23 ft-bg. The borings were positioned along the approximate centerline and margins of the contaminant plume to provide a horizontal and vertical profile of soil and groundwater quality. In general, the maximum photoionization detector (PID) response of ~1.6 x 10^7 microvolts [µV] and flame ionization detector (FID) response of ~5 x 10^7 µV were measured at a depth of approximately 5.5 feet within plume centerline boring MIP-1 located in the contaminant source area (near the northern wall of the garage building).[4] These responses reflect excessively impacted shallow soil and groundwater and are consistent with data obtained from the direct sampling of source area borings and wells. The PID response decreased by more than an order of magnitude in the downgradient direction to ~1.0 x 10^6 µV recorded at a depth of about 7.5 feet within plume margin boring MIP-7 (located ~265 feet east of MIP-1). The FID response at this location remained elevated, and approached 4 x 10^7 µV which may be related to methane from the nearby wetland area given that FID is more sensitive to combustible volatile organic compounds.

Based on the MIP survey results, confirmatory soil borings were advanced and sampled adjacent to MIP-1, MIP-3, MIP-4 and MIP-7. Soil samples were collected from a depth corresponding to the highest MIP PID measurement and analyzed for total organic carbon, total petroleum hydrocarbons, and the PADEP short list compounds for unleaded gasoline and diesel fuel.[5] Temporary wells were also installed in these borings for groundwater sample collection and analyzed for the same parameters. Analytical results from these soil and groundwater samples generally corroborated the MIP survey findings. Bidders are encouraged to review the MIP boring locations and subsurface profiles, and the related soil boring and temporary well data provided in the March 2017 RAP (Attachment 3d).

<u>Groundwater Quality</u>

Groundwater quality has been assessed through a compliance sampling network consisting of monitoring wells MW-1 through MW-13, MW-14S, MW-14D, OW-1 and OW-2 installed on the HFI property.[6] The RAP has determined through fate and transport modelling that benzene and MTBE must be at our below 155 ug/L and 818 ug/L, respectively, at MW-10 (the SSS) in order

[4] PID and FID responses of approximately 1.0 x 10^7 µV and 3.0 x 10^7 µV, respectively, were measured at a depth between 13 and 14 ft-bg within MIP-1 possibly suggesting deeper impacted material in the source area.
[5] A Shelby tube soil sample was also collected from each boring at depths ranging from approximately 5.0 to 7.5 ft-bg and submitted for geotechnical analysis. Based on the geotechnical analyses, shallow soil was classified as silty sand to sandy silt.
[6] Additionally, two drive-point wells, DPW-1 and DPW-2, were advanced within the wetlands area in the eastern portion of the Site, but it is unclear whether these installations still exist.

to be protective of human and ecological exposures at the downgradient, unnamed tributary to North East Creek which receives diffuse discharge of impacted Site groundwater. Groundwater quality near the wetlands and stream is monitored by MW-11. The RAP used fate and transport modeling to calculate the SSS for benzene and MTBE at MW-11 as 14 ug/L and 216 ug/L, respectively. Groundwater sampling locations are depicted in the figure provided in Attachment 3a. Historical groundwater analytical results are provided in the third quarter 2018 RAPR (Attachment 3g). Boring logs and construction details for the site monitoring wells are provided in the June 2016 RSCR and March 2017 RAP.

Groundwater samples have historically been analyzed for the current (most up to date) PADEP short lists of unleaded gasoline and diesel fuel parameters. COCs in site groundwater (i.e., compounds exceeding the PADEP Act 2 non-residential SHS MSCs) primarily consist of benzene and MTBE which remain problematic in POC well MW-11 and have been detected in surface water and sediment samples as discussed in more detail below. Although benzene and MTBE concentrations have been trending downward at MW-10, these compounds appear to be increasing (benzene) or steady (MTBE) in MW-11.

Other dissolved-phase COCs that continue to be detected in site groundwater include toluene, ethylbenzene, naphthalene and 1,2,4-TMB. Of these compounds, overall steady to increasing concentration trends are exhibited for benzene (source area wells MW-4, MW-7 and MW-14D), and toluene, ethylbenzene, naphthalene and 1,2,4-TMB in source area well MW-7. These monitoring wells are located adjacent to the northern wall of the garage building (MW-4) and beyond the northeast corner of the building (MW-7 and MW-14D). Additionally, concentration trends for all COCs in source area observation wells OW-1 and OW-2 appear to be increasing to flat. The increasing to flat concentration trends at these well locations are indicative of residual source soil that remains adjacent to and beneath the truck garage.

The most impacted site well is OW-2 which is located in the source area beyond the northeast corner of the truck garage. During the third quarter 2018, concentrations of COCs in this well were reported as: benzene (15,300 µg/l), toluene (8,390 µg/l), ethylbenzene (2,900 µg/l), MTBE (182 µg/l), naphthalene (250 µg/l), and 1,2,4-TMB (1,290 µg/l).

In July 2016, groundwater samples were collected from wells located along the interpreted centerline of the dissolved-phase benzene plume (MW-1, MW-4, MW-6, MW-7, MW-10, MW-11 and MW-12) for evaluation of natural attenuation processes. Samples were analyzed for chemical indicators of natural attenuation including nitrate, sulfate, total iron, dissolved iron and ferric iron. Groundwater samples were also obtained from select wells within the source area and downgradient groundwater treatment area (MW-4, MW-10 and MW-11) and analyzed for chemical oxygen demand (COD) and total organic carbon (TOC). Results from measurements of field parameters were also included in the natural attenuation assessment including, in part, oxidation reduction potential (ORP), dissolved oxygen (DO) and total dissolved solids (TDS). Results from these analyses can be found in the March 2017 RAP. **Bidders should note that**

total iron was reported at concentrations up to 47.6 mg/l (source area well MW-4) which would likely require remedial system design provisions for metals sequestration should one of the in-situ remedial alternatives (defined below) be selected that includes dual phase extraction. Based on the results provided from the natural attenuation assessment, RETTEW generally concluded that natural attenuation of unleaded gasoline compounds is occurring via biodegradation.

Surface Water and Sediment Quality

Surface water and sediment samples were collected in February 2016 at points established along the unnamed tributary to North East Creek. The sampling points included Stream-1 / Sed-1 (upstream) and Stream-2 / Sed-2 (downstream) to identify potential impacts related to the diffuse discharge of site groundwater into surface water. Analytical data for these samples reveal that benzene and MTBE were detected in the Stream-1 and Stream-2 surface water samples at concentrations of 19 / 25 ug/l and 1 / 12 ug/l, for benzene and MTBE respectively. Laboratory results for the sediment samples collected at the Sed-1 location indicated concentrations of benzene (5 ug/kg) and MTBE (160 ug/kg). No target analytes were detected in the Sed-2 sediment sample.

A subsequent round of surface water samples obtained from the Stream-1 location in April 2016 yielded results of 14 ug/l benzene and 19 ug/l MTBE. Also in April 2016, two additional surface water and sediment sampling points were established (Stream-3 / Sed-3 and Stream-4 / Sed-4) further upstream of the Stream-1 / Sed-1 location. At these sampling points, no benzene was detected in the surface water samples although MTBE was found in the Stream-3 sample at a trace concentration of 0.7 ug/l. No target compounds were identified at the Sed-3 sample location although the Sed-4 sample contained concentrations of benzene, MTBE and cumene at 38, 5 and 6 ug/kg, respectively.[7] Locations of the surface water and sediment sampling locations are provided on the figures contained in the June 2016 RSCR.

Free Phase Hydrocarbons

Free-phase petroleum hydrocarbons (FPH) were present in monitoring well MW-4 during the June 25 and July 9, 2015 groundwater monitoring events at measured thickness of 0.15 and 0.12 feet, respectively. Laboratory “fingerprint” analysis of an FPH sample determined that the product was relatively unweathered gasoline.

Bailing tests were completed to evaluate FPH recoverability. The methods and results from this testing are described in the June 2016 RSCR (Attachment 3c). However, no measureable FPH

[7] Additionally, a storm water sample was collected from a drainage culvert that discharges to the stream from the asphalt parking area to determine whether storm water runoff may be contributing to the surface water and sediment impacts. No compounds of interest were detected in the storm water sample.

was observed in MW-4 following the July 9, 2015 sampling event and, historically, FPH has never been observed in any other site monitoring well.

Contaminant Fate & Transport Modeling

Updated contaminant fate & transport (F&T) modeling using the PADEP Quick Domenico (QD) spreadsheet application was completed for the March 2017 RAP. Calibrated models for benzene and MTBE were developed to estimate steady state concentrations near the point of diffuse groundwater discharge to the wetland area and stream. Source concentrations for benzene and MTBE were based on maximum concentrations historically observed in the most severely impacted source area well, OW-2, through the January 2017 groundwater analytical dataset. The model calibration process was based on the distance between OW-2 and downgradient wells MW-10 and MW-11 located along the plume centerline approximately 100 and 255 feet east of OW-2, respectively. Contaminant loading to surface water was estimated using the PADEP SWLOAD5 model spreadsheet which was generally based on the same assumptions and input parameters as the QD model. Based on output from the SWLOAD5 models, water quality-based effluent limits for portions of the benzene and MTBE plumes that exceeded the edge criterion were calculated using the PADEP PENTOXSD model spreadsheet. The PENTOXSD modeling generated the most restrictive waste-load allocations to surface water for benzene and MTBE as the governing criteria (i.e. applicable surface water quality criteria).[8]

The calculated governing criteria for benzene and MTBE were used to back-calculate source concentrations at OW-2 that would need to be achieved in order to meet the applicable surface water quality standards. The target remedial endpoints for benzene and MTBE in groundwater at OW-2 were calculated to be 332 ug/l and 1,800 ug/l, respectively. As mentioned above, the RAP modelling determined that benzene and MTBE in groundwater must be at or below 155 ug/L and 818 ug/L, respectively, at MW-10 (the groundwater numerical SSS) in order to be protective of human and ecological exposures at the downgradient unnamed tributary to North East Creek. Additional details regarding the F&T modeling, including input parameters, calibration methods, model output and back calculations, are provided in the March 2017 RAP.

Vapor Intrusion Study

A study was conducted to evaluate the potential for vapor intrusion to non-residential indoor air based on guidance predating the January 2017 revised PADEP technical guidance. The study generally consisted of installing a permanent sub-slab soil gas monitoring point (SG-1) to a depth of approximately 3.5 feet below the floor of the truck garage at a location adjacent to the northern wall.[9] An attempt at collecting a soil gas sample from this monitoring point was

[8] F&T modeling was performed for a reach of the unnamed tributary to North East Creek extending from the Stream-1 surface water sampling point to the confluence of the tributary with North East Creek.
[9] The estimated area of maximum unleaded gasoline and diesel fuel impacts to soil and groundwater.

unsuccessful due to the presence of shallow groundwater. A sub-slab soil gas sampling port (SG-2) was then installed to a shallower depth of ~1 foot at an adjacent location. Soil gas samples were collected from sampling port SG-2 on March 25 and April 13, 2016 and analyzed for the current PADEP short list compounds for unleaded gasoline and diesel fuel. No target compounds exceeded the non-residential soil vapor MSCs during these sampling events. Additional details regarding the vapor intrusion study can be found in the June 2016 RSCR. A milestone for completing a supplemental vapor intrusion assessment is included in this RFB in order to meet the requirements of PADEP's 2017 guidance.

Overview of Site Remedial Actions

Persulfate ISCO was prescribed in the PADEP-approved RAP. This technology was implemented during May and June 2018.[10] The plan divided the treatment area into three distinct remediation target areas consisting of RA1 (source area adjacent to and north of garage building), RA2 (adjacent to and downgradient of RA1; primary section of groundwater plume) and RA3 (adjacent to and downgradient of RA2). The injection design was customized to each remediation target area based on site characterization information and remedial injection pilot testing results (e.g., number of injection points, treatment depth, volume of injectant mixture, etc.). The ISCO injectant consisted of a mixture of sodium persulfate with sodium hydroxide (25%) added as an activator.

In general, the proposed scope of work for implementing the ISCO injections involved:

- Operating two direct-push drilling machines for conducting injection activities in two remediation target areas simultaneously.
- Injecting the chemical oxidant mixture at two-foot vertical intervals from top to bottom.
- Adding hydrated bentonite to each borehole prior to injection to assist with preventing "daylighting" of chemicals at the ground surface.
- Dividing each injection location into two adjacent borings to discretely target the shallow silty sand and deeper schist saprolite.
- Injecting the chemical oxidant mixture at a maximum pressure of 5 psi and a minimum average flow rate of 1.5 gpm in the deeper saprolite, and injecting at a higher pressure in the shallow silty sand to induce hydraulic fracturing.
- Manifolding multiple injection points for simultaneous mixing and injection.

As summarized below, the ISCO injections appear to have mixed results with respect to groundwater quality.

[10] The ISCO remedy, and the remedial actions described in this RFB from which the bidder may select, are intended to stabilize the contaminant plume and reduce contaminant concentrations in groundwater so that applicable surface water loading criteria are achieved at the groundwater / surface water interface.

During implementation of the ISCO remedy, injecting the full design volume of chemical oxidants was not achieved due to significant groundwater / chemical surfacing that reportedly resulted from unexpected areas of low soil permeability (i.e., soil heterogeneity) and possibly from high water table conditions.[11] Due to subsurface conditions and conditions encountered during the initial phase of work, only one direct-push machine was used rather than two and injections were conducted within one boring at a time instead of manifolding multiple injection borings. The injectant was applied only to select vertical intervals within each boring to minimize chemical surfacing which remained problematic. Partial injections were performed within each of the three remediation target areas, although not all of the proposed injection borings were completed - including those in the area of the most impacted source area well OW-2.

Based on surface water observations and field testing during the chemical injections, including apparent staining in the stream channel and results from colorimetric test strip monitoring for sodium persulfate, field personnel were concerned that the chemical oxidants were discharging with groundwater into the eastern site wetlands and stream area. Consequently, injection activities were suspended, the PADEP was notified and emergency response actions were undertaken including vacuum extraction of suspected impacted surface waters.[12] Upon further review of surface water monitoring and sampling results, it was concluded that the suspected surface water impacts were not related to the injection activities, but likely resulted from elevated iron concentrations in groundwater.[13]

Information regarding the ISCO pilot testing can be found in the March 2017 RAP (Attachment 3d). Additional details regarding implementation of the ISCO remedy including the activities / findings related to possible surface water impacts from the chemical injections can be found in the third quarter 2018 RAPR (Attachment 3g).

Solicitor's Selected Site Closure Standard

Solicitor proposes to attain the PADEP Act 2 Site-Specific Standard via pathway elimination and numeric risk-based standards for the current PADEP short-list of unleaded gasoline and diesel fuel parameters in soil and groundwater.

Other Information

To the extent there is any discrepancy between the summary of site conditions provided above and the source documents, bidders shall rely on the source document information. Bidders should carefully consider what information, analyses, and interpretations contained in the

[11] Less than 50 percent of the target volume of chemicals was injected before the remedial actions were terminated.
[12] The wetlands and stream fall within a protected habitat area for the bog turtle.
[13] Following the emergency response actions, it was determined that the colorimetric test strips used to field test the surface water were sensitive to both iron and sodium persulfate.

background documents can be used in developing their scope of work for their bid in response to this RFB.

Scope of Work (SOW)

This RFB seeks competitive bids from qualified contractors to perform the activities in the SOW specified herein. The PADEP case manager reviewed the SOW presented in this RFB and PADEP's comments have been incorporated.

Objective

Remedial efforts to date have not adequately addressed the site contamination. The ISCO injections appear to have mixed results with respect to groundwater quality. Residual contaminant mass appears to be sustaining downgradient groundwater contamination concentrations above the SSS numeric closure standards. Therefore, the goal of the work outlined in this RFB is to target and cost-effectively address the residual contaminant mass to achieve a SSS site regulatory closure within a reasonable timeframe.

The PADEP, the Technical Contact, and the PAUSTIF have agreed that one of the following offers a reasonable prospect of completing the remaining cleanup to achieve SSS within a reasonable timeframe:[14]

1) **Alternative #1 – Soil Excavation, Application of Oxygen Delivery Product, followed by MNA**. Soil excavation will be used to remove source material in the subsurface for off-site disposal. The contamination is relatively shallow, significant organic matter in the shallow subsurface may be holding petroleum contaminants, and source soils are expected to be accessible for excavation in the parking areas. Oxygen Delivery Product will be added in select areas prior to backfilling. Some inaccessible contamination at depth or beneath structures will need to attenuate via monitored natural attenuation (MNA). Water management may be necessary; or

2) **Alternative #2 – Air Sparge (AS) / Dual Phase Extraction (DPE)**. With much of the overburden classified as silty sand, air sparge will be used to volatilize petroleum contaminants. Due to shallow groundwater, dual-phase extraction (DPE) will be used to capture sparge air while minimizing groundwater mounding and extraction; or

3) **Alternative #3 – DPE.** Due to shallow groundwater, dual-phase extraction (DPE) will be used to lower the water table, extract impacted groundwater, and extract volatilized petroleum vapors.

[14] This RFB Scope of Work does not include soil attainment sampling since pathway elimination via institutional controls is anticipated to preclude exposure to impacted soil residuals.

Bidders shall propose one of these three remedial alternatives in their bid response. The bidder's remedial approach shall remediate the soil and groundwater in the areas outlined in the Figure 4 provided in Attachment 3a.

Solicitor seeks competitive, fixed-price bids for this Bid to Result RFB to complete the 13 milestones outlined below intended to take this Site to closure. To be deemed responsive, each bid *must* respond *in detail* to each of the milestones, including describing the bidder's understanding of the conceptual site model and how that model relates to the bidder's proposed approach to executing the SOW. "Bid to Result" RFBs identify task goals and rely on the bidders to provide a significant level of detail on how they will achieve the goal. Each bid must detail the approach and specific methods for achieving the milestone objectives. In reviewing the quality of bids submitted under Bid to Result solicitations, there is an increased emphasis placed on technical approach and reduced emphasis on cost (as compared to bids for "Defined Scope of Work" RFBs). As mentioned above, the Solicitor has elected to pursue environmental closure based on demonstrating attainment of the PADEP's SSS for soil and groundwater.

Selecting one of the remedial approaches defined above shall be the basis for preparing a SOW and presenting a competitive fixed-price bid. The selected bidder shall perform pilot testing, as applicable, to confirm the bid remedial technologies can feasibly meet the remedial goals for this site in general accordance with bidder's assumptions.

Constituents of Concern (COCs)

Soil, groundwater and soil gas samples collected at the Site have been analyzed for the current PADEP Act 2 short-list of unleaded gasoline and diesel fuel compounds (benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, cumene, 1,2,4-TMB and 1,3,5-TMB). Based on these analyses, the COCs present in site environmental media include the following:

Soil – Soil sampling conducted in the past suggest that excessive adsorbed-phase contamination remains. Sustained dissolved contamination suggests soil remains an ongoing secondary source of groundwater impacts.

Groundwater – Remediation endpoints were calculated for benzene and MTBE in groundwater using fate and transport models presented in the RAP. Calculated remediation endpoints for benzene and MTBE in groundwater at OW-2 (referred to as "Source Concentration"), MW-10 and MW-11 are provided in the following table. The remediation completed under this RFB shall attain stabilized benzene and MTBE at or below these concentrations at these locations.

Parameter	Groundwater Value	Comments
Benzene Source Concentration	332 µg/L	SWLOAD5 back calculation
MTBE Source Concentration	1,800 µg/L	SWLOAD5 back calculation
Benzene Concentration at MW-10	155 µg/L	Calculated 100 feet from OW-2
MTBE Concentration at MW-10	818 µg/L	Calculated 100 feet from OW-2
Benzene Concentration at MW-11	14 µg/L	Calculated 255 feet from OW-2
MTBE Concentration at MW-11	216 µg/L	Calculated 255 feet from OW-2

The calculated benzene and MTBE concentrations presented above are the PADEP-approved remediation endpoints to serve as target concentrations to monitor and verify remedial effectiveness at OW-2, MW-10 and MW-11 (these three wells are called the "**Key Compliance Wells**" in this RFB) for the purpose of attaining applicable surface water standards. It is noted that the fate and transport analysis presented in the RAP concluded that MTBE had reached steady state and that the criteria are met into the future. This condition will be monitored and re-evaluated during remediation.

Soil gas – As mentioned above, a study was conducted to evaluate the potential for vapor intrusion to non-residential indoor air based on guidance predating the January 2017 revised PADEP technical guidance. Results from soil gas samples collected on March 25 and April 13, 2016 from a shallow sub-slab sampling port installed in the truck garage indicated that no target compounds exceeded the non-residential soil vapor MSCs. A supplemental vapor intrusion assessment shall be conducted under this RFB in order to meet current protocols as outlined in PADEP's 2017 guidance.

General SOW Requirements

The bidder's approach to completing the SOW shall be in accordance with generally accepted industry standards/practices and all applicable federal, state, and local rules, regulations, guidance, and directives. The latter include, but are not limited to, meeting the applicable requirements of the following:

- The Storage Tank and Spill Prevention Act (Act 32 of 1989, as amended);
- Pennsylvania Code, Title 25, Chapter 245 - Administration of the Storage Tank Spill and Prevention Program;
- The Land Recycling and Environmental Remediation Standards Act of 1995 (Act 2), as amended);
- Pennsylvania Code, Chapter 250 - Administration of Land Recycling Program; and
- Pennsylvania's Underground Utility Line Protection Law, Act 287 of 1974, as amended by Act 121 of 2008.

During completion of the milestone objectives specified below and throughout implementation of the project, the selected consultant shall:[15]

- Conduct necessary, reasonable, and appropriate project planning and management activities until the project (i.e., Remediation Agreement) is completed. Such activities may include Solicitor communications/updates, meetings, record keeping, subcontracting, personnel and subcontractor management, quality assurance/quality control, scheduling, and other activities (e.g., utility location). Project planning and management activities will also include preparing and implementing plans for health and safety, waste management, field sampling/analysis, and/or other plans that are necessary and appropriate to complete the SOW, and shall also include activities related to establishing any necessary access agreements. Project planning and management shall include identifying and taking appropriate safety precautions to not disturb Site utilities including, but not limited to, contacting Pennsylvania One Call as required prior to any ground-invasive work. As appropriate, project management costs shall be included in each bidder's pricing to complete the milestones specified below.
- Be responsible for coordinating, managing, and completing the proper management, characterization, handling, treatment, and/or disposal of all impacted soils, water, and derivative wastes generated during the implementation of this SOW. The investigation-derived wastes, including purge water, shall be disposed in accordance with standard industry practices and applicable laws, regulations, guidance, and PADEP directives. Waste characterization and disposal documentation (e.g., manifests) shall be maintained and provided to the Solicitor and the PAUSTIF upon request. All investigation derived wastes shall be handled and disposed per PADEP's Regional Office guidance. It is the selected consultant's responsibility to conform with current PADEP Regional Office guidance requirements in the region where the Site is located.
- Be responsible for providing the Solicitor and/or facility owner with adequate advance notice prior to each visit to the property. The purpose of this notification is to coordinate with the Solicitor and/or facility owner to ensure that appropriate areas of the property are accessible. Return visits to the Site will not constitute a change in the selected consultant's SOW or result in additional compensation under the Remediation Agreement.

[15] As such, all bids shall include the costs of these activities and associated functions within the quote for applicable tasks/milestones.

Site-Specific Guidelines

As part of this RFB, the selected consultant will need to consider the following site-specific guidelines:

On-Property Access. Although the Herr Foods facility operates on relatively large parcels, maneuverability could be challenging during peak business hours. As such, safety precautions should be carefully considered prior to and during any field activities along with an elevated level of attentiveness. Should it be necessary to temporarily close or restrict access to portions of the Site to complete any of the milestones within this RFB, the Solicitor requires at least two (2) weeks advance notice for coordinating / scheduling the site activities with the HFI site contact.

Off-Property Access. Selected consultant will be responsible for securing off-property access where needed to implement the remedial approach. Work required to negotiate and secure off-property access shall be included within the fixed price for Milestone D. It is reasonable to assume that Solicitor will assist, as needed, with this effort.

Field Activities. All on- and off-property work should be conducted during the normal business days and hours of 8:00 AM to 5:00 PM from Monday through Friday, unless work outside of these normal business days and hours is authorized by the respective property owner. The selected consultant will be responsible for determining and adhering to other restrictions that may apply to the Herr Foods property or surrounding properties.

Responsibility. The selected consultant will be the consultant of record for the site. The selected consultant will be required to take ownership of the project and will be responsible for representing the interests of the Solicitor, property owner and ICF/PAUSTIF with respect to the project. This includes utilizing professional judgment to ensure reasonable, necessary and appropriate actions are recommended and undertaken to protect sensitive receptors and carry out adequate remedial actions in order to move the site toward closure.

Field Instrumentation. Each bidder should state in its bid response the appropriate field instrumentation (e.g., pumps, meters, photoionization detectors, etc.) to be used during the completion of the SOW. Specifically, the product associated with the regulated release at this site is unleaded gasoline and diesel fuel. As such, any field-screening instrumentation used at the site should be able to detect the presence of hydrocarbons associated with these types of products.

Safety Measures. Each bidder should determine the safety measures necessary to appropriately complete the milestones. Specifically, if a consultant feels that it is appropriate and necessary to complete utility clearance using an air knife, the cost should be included in its fixed-price cost. If a bidder includes costs to conduct specific safety measures or activities, the

bidder should specify it in the bid response and discuss why it is appropriate and necessary and indicate which methods will be utilized and to what extent. As discussed in the RFB, cost is not the only factor when evaluating bid responses and other factors are taken into consideration during the bid evaluation process, including appropriate safety measures.

Waste Disposal.[16] The investigation derived waste (including, but not limited to, soil/rock cuttings, used carbon, well development / purging liquids, and groundwater removed during pilot testing activities) shall be disposed per the instructions included in the "General SOW Requirements" section of the RFB. Bidders will be responsible for arranging any off-site waste disposal (if required) and including costs in their bid response to cover the disposal of all potential waste related to the milestones included in the SOW. Containerized soil and groundwater may be temporarily stored on the Herr Foods property at a location approved by the property owner, but should be removed from the property as quickly as possible. Each bidder should estimate the volume of waste using its professional opinion, experience and the data provided. **ICF and PAUSTIF will not entertain any assumptions from the selected bidder in the Remediation Agreement with regards to a volume of waste. Invoices submitted by the selected bidder to cover additional waste disposal costs as part of activities included under the fixed-price Remediation Agreement for this site will not be paid.**

Site-Specific Milestones

Milestone A – Supplemental Site Characterization Activities. This milestone provides bidders the opportunity to identify which additional site characterization work that will be completed in advance of finalizing the remedial design and moving ahead with its implementation. Conducting supplemental investigative activities under this milestone is mandatory. PAUSTIF will be reimbursing up to $10,000 for supplemental site characterization and documentation costs under this milestone. Bidders are to describe what supplemental site characterization will be completed, the rationale for the work and how the derived data will be used. For purposes of bidding, and to ensure consistent cost scoring of bids, each bidder will enter exactly $10,000 as the bid price for Milestone A in the Bid Cost Spreadsheet. PAUSTIF will only reimburse up to $10,000 of reasonable and necessary costs for those tasks actually performed. The selected bidder must provide time and material documentation in addition to supporting documentation required (in Exhibit B of the executed Remediation Agreement) to support the requested reimbursement and completion of this milestone.

Bidders may use this opportunity to: 1) confirm any elements of the site characterization completed by a previous consultant; 2) address any perceived data gaps in the existing site characterization work; 3) assist in the evaluation and determination of remedial technologies

[16] This paragraph pertains to IDW only. Reimbursement of costs associated with contaminated soil transportation and disposal resulting from excavation are discussed under Milestone F6 below.

and system design that are characterization-type activities (e.g. analysis for C_4-C_{12}); 4) assist with refining the cleanup timeframe estimate and/or other reasons related to validating the bidder's remedial approach and design (e.g. additional sampling to better determine contaminant mass in place). Note that all tasks and costs related to pilot testing and reporting must be captured under the Pilot Testing and Reporting Milestone, not Supplemental Site Characterization Activities. If pilot testing tasks and costs are included in this Site Characterization Milestone, the bidder's technical score will be negatively impacted.

Milestone A activities shall be conducted as soon as possible following execution of the Fixed-Price Remediation Agreement.

Each bidder shall describe in detail its scope of work for additional site characterization activities along with corresponding technical justification to support the need for each additional activity. When considering what additional site characterization activities may or may not be necessary, bidders are strongly encouraged to review the June 2016 revised SCR (Attachment 3c) and March 2017 RAP (Attachment 3d) and the other documents provided in Attachment 3, rather than relying solely on the summary information presented in this RFB.

Example potential activities for bidders to consider may include tasks such as: i) advancing and sampling additional soil borings to further delineate the extent of suspected impacted unsaturated / smear zone soil or groundwater; ii) further sampling and laboratory analysis of groundwater samples for iron and manganese to further assess the potential for remedial system fouling; and iii) conducting geotechnical sampling / analysis for grain size distribution, bulk density and porosity to assist with remedial system design including proper screening / filter pack selection for recovery wells, etc. Any and all Milestone A activities that are proposed with your firm's bid shall be accompanied by the following:

- The purpose and need for each Milestone A activity and an appropriate breakdown;
- A detailed scope description of each activity including the use and incorporation of any pre-existing site data;
- The timing and schedule of each activity relative to the overall project schedule; and
- A description of the anticipated results of each activity and how such results may impact your proposed conceptual remedial action plan.

Following completion of the additional site characterization activities, these Milestone A activities shall be documented as discussed in Milestone D.[17]

[17] In order to receive reimbursement under this task, thorough documentation of the additional site characterization activities must be provided to PAUSTIF.

Milestone B – Vapor Intrusion Study. In the General Site Background and Description section of this RFB, a brief discussion was included regarding the historical soil vapor sampling conducted during March and April 2016. However, in order to comply with the requirements of the revised PADEP Technical Guidance Manual for Vapor Intrusion into Buildings from Groundwater and Soil Under Act 2 (effective 1/18/17), a vapor intrusion study shall be conducted to determine if there are any current or future potentially excessive indoor air exposure risks that may need to be controlled via engineering and intuitional controls.[18]

Under this milestone, bidders shall describe and provide a firm fixed-price cost for conducting a vapor intrusion study that shall adhere to the new PADEP guidance. The vapor intrusion study shall be completed ***before*** Milestone C (Pilot Testing and Reporting) and may include modifying the location and/or depth of the existing soil vapor sampling point (SG-2) or adding additional soil, sub-slab or indoor air sampling points. Results shall be used to determine if excessive indoor air human health risks may exist requiring mitigation via engineering and institutional controls. Each bidder shall provide a detailed description of its proposed methods, installation details for any proposed vapor points, number of sampling points, sampling techniques and analysis, and number / timing of sampling events along with a site plan depicting the locations of any new soil, sub-slab or indoor air monitoring point locations, as applicable.

Vapor samples shall be submitted to a PADEP-accredited laboratory for analysis of the current PADEP short-list of unleaded gasoline and diesel fuel parameters using appropriate analytical methods and detection levels. Appropriate QA/QC samples shall also be collected during each event and analyzed for the same parameters (e.g., trip blank, blind duplicate). Results from the vapor intrusion assessment shall be taken into account when preparing the Revised RAP (Milestone D).

Milestone C – Pilot Testing and Reporting (Applicable only to Alternative #2 or #3). Pilot testing shall be proposed to support the feasibility and appropriateness of the bidder's proposed remedial technology and approach. More specifically, the purpose of the pilot test is to:

- Confirm that bidder's proposed technology is technically viable;
- Confirm that bidder's proposed remedial approach can be expected to be efficient & cost-effective;
- Confirm that bidder's proposed technology will achieve the remedial objective within a reasonable timeframe; and
- Confirm remedial design criteria assumed in the bid.

[18] If vapor mitigation is required on current commercial buildings, the design and implementation of such VI mitigation system would be considered a New Condition under the contract.

The bidder shall provide a detailed description of the proposed pilot testing, objectives and rationale including any concerns with historical pilot testing data, perceived existing data gaps, proposed methods, the use of existing or installation of new data monitoring / collection points, proposed equipment to be used, and the data that is proposed to be collected. Each bid shall also describe how the data/information would be evaluated. In formulating its pilot testing proposal, bidders shall also consider the following:

- Pilot testing at more than one test well location to account for differences in subsurface permeability across the extent of the groundwater plume which could include heterogeneous areas of natural silty clay soil, gravel / reuse clay excavation backfill, or backfill associated with building construction.
- Results of the prior ISCO pilot testing and prior ISCO full-scale implementation, which were documented in the March 2017 RAP (Attachment 3d) and the third quarter 2018 RAPR (Attachment 3g), respectively, to account for varying subsurface characteristics across the extent of the groundwater plume.

For pilot testing proposed in this milestone, bidders shall also specify up to five key pilot test outcome criteria that establish whether the bidder's proposed remedial action is feasible. These "critical criteria" shall be listed with an upper and lower limit that will define the range of acceptable results (i.e., pilot testing results) relevant to the bidder's proposed remedial approach. These critical criteria must be tightly-controlled measurements or calculations that could be independently measured or verified by others during the pilot test.

For example, bids shall include language such as, "For our proposed remedial action approach to be successful and for the technology(ies) used thereby to operate as planned and meet our proposed clean up schedule, the pilot testing must show:

1. A hydraulic conductivity greater than X ft/day, but not more than Y ft/day;
2. A dual-phase groundwater yield rate exceeding X gpm at the end of Y hours under a vacuum of Z in. Hg;
3. The capacity to generate a soil vapor extraction vacuum of at least X in. Hg while not exceeding an air flow rate of Y scfm;
4. The ability to inject sparge air at a pressure of at least X psi and a flow rate of at least Y scfm;
5. An effective air sparge radius of influence of X feet;
6. The capacity to maintain vacuum conditions during simultaneous air sparging / DPE within the air sparge zone of influence;

7. An injection rate of at least X gpm in the natural clay soil beyond the UST cavity and excavation footprint; or
8. Iron and manganese hardness within groundwater at or below X milligrams per liter (mg/L)."

This is only an example. Actual bid language and the associated critical criteria will vary by bidder.

The critical criteria identified in each bid and their associated acceptable range of testing results will be evaluated as part of the bid review. Unrealistic critical criteria, or critical criteria that are unreasonably narrow, will reduce the favorability of the bid. Please note that all bidders shall propose to perform pilot testing covering the applicable technologies prescribed under either remedial Alternative #2 or #3 to confirm that the remedial approach to be proposed in the selected bidder's Revised RAP will be feasible, safe and effective.

The Milestone C proposal shall reflect an understanding that the selected bidder will prepare a Pilot Test Report and submit it to the Solicitor and PAUSTIF. The Pilot Test Report shall show that the pilot test was conducted according to the selected consultant's bid and shall constitute documentation for payment of Milestone C regardless of the result. If the results of the pilot testing show that the proposed remedial action is feasible based on the specified critical criteria and ranges, and is safe and effective, then the selected consultant shall be expected to move forward with the project under the contract. The Milestone C activities shall also be included in the reporting for Milestone D.

"Pilot Test Off-Ramp" – The selected consultant and the Solicitor are protected from being obligated to move forward with a remedial action under the executed Remediation Agreement if the proposed remedial approach cannot be safely or efficiently implemented as proposed in the conceptual design based on critical criteria outside the bidder's defined ranges from the pilot test data from Milestone C. Exhibit A of the Remediation Agreement (Attachment 1) will contain a provision that if the selected consultant's proposed remedial approach is not reasonable based solely on pilot test results indicating that it cannot be implemented as proposed in the conceptual design based on critical criteria outside the bidders defined ranges from the pilot test data from Milestone C, then one of the following conditions will apply:

1) With advance Solicitor and PAUSTIF approval, the selected bidder may elect to modify the remediation plan and continue with the project at no additional cost; that is, for the same total fixed price found in the bid response or a lesser fixed-cost. If selected consultant's modified plan is approved by Solicitor and by PAUSTIF for funding, the executed Remediation Agreement may be amended, if necessary, to agree with the modified remediation plan and costs; however, the total fixed price of the Remediation Agreement shall not be increased.

2) If the Solicitor or PAUSTIF choose not to approve the selected consultant's revised remediation plan adjusting to the new data, the Remediation Agreement for the project will terminate.

3) If the selected consultant adequately demonstrates the site conditions revealed by the results of pilot testing performed under Milestone C could not have reasonably been expected prior to conducting the Milestone C activities, the selected consultant may elect to not proceed and to terminate the Remediation Agreement for the project.

If either party elects to cancel the Remediation Agreement, the PAUSTIF will have complete discretion with regard to the use of the information obtained during Milestone C activities and/or in the Pilot Test Report. The PAUSTIF may use the data as the basis for rebidding the project; however, it will be specified that any use that a third party makes of the supplemental site characterization data and/or Pilot Test Report will be at the sole risk of the third party.

Pilot Test Bid Cost – For consistency, bidders shall budget a maximum of 10% of the total bid cost for this Milestone, with a maximum of $50,000. For example, if the total proposed cost for Milestones A through M (excluding C) is determined to be $300,000, the fixed-price cost of Milestone C specified in the bid cost spreadsheet shall be up to, but not exceed $30,000. However, if the total proposed cost for Milestones A through M (excluding C) is determined to be $550,000, the fixed-price cost of Milestone C specified on the bid cost spreadsheet shall be up to, but not exceed $50,000.

Milestone D – Documentation of Findings: Preparation, Submittal, and PADEP Approval of Revised RAP. Upon completing Milestones A through C described above, the selected bidder shall prepare a Revised RAP under Milestone D to implement one of the three alternative remedial approaches specified above for this site. In general, the Revised RAP shall: i) document the supplemental site characterization and pilot testing activities and findings; ii) discuss the details of the alternative remedial approach; iii) contain all necessary information required under 25 PA Code §245.311; and iv) be of sufficient quality and content to reasonably expect PADEP approval. The Revised RAP shall first be submitted in draft form to the Solicitor and PAUSTIF for review and comment before being finalized and submitted to the PADEP. Each bidder's project schedule shall provide two (2) weeks for Solicitor and PAUSTIF review of the draft document. The final report shall address comments received from the Solicitor and PAUSTIF on the draft report before it is submitted to the PADEP for its review.

The Revised RAP shall describe and provide an evaluation of all findings generated under Milestones A through C, updating the conceptual site model (CSM) for the Site and its vicinity based on evaluating the results from the additional site characterization and pilot testing tasks outlined above, and detailing the proposed alternative remedial approach. The report shall incorporate information and relevant findings from the previous site documentation (as

necessary), and contain all necessary and appropriate figures, tabulated data, and appendices to comply with the regulatory requirements for and to obtain PADEP approval of the report.

The Revised RAP shall be signed and sealed by a Professional Geologist licensed in the Commonwealth of Pennsylvania, and may also require the signature and seal of a Professional Engineer registered in the Commonwealth of Pennsylvania (bidders shall refer to state licensing laws to determine if the Professional Engineer seal is required based on the work performed for and documented in the combined report). The fixed-price cost shall also include addressing any PADEP comments on the Revised RAP.[19]

The successful bidder will be eligible to receive payment for 75% of the bid amount for Milestone D when there is proof the document has been completed and submitted to PADEP. The 25% balance will be due for reimbursement once proof has been provided that PADEP has approved the Milestone D deliverable document.

Milestone E – Pre-Remediation Quarterly Groundwater Monitoring, Sampling & Reporting. Under this task, bidders shall provide a firm fixed-price to continue with quarterly groundwater monitoring, sampling, and reporting events while performing the supplemental site characterization activities (Milestone A), vapor intrusion study (Milestone B), pilot testing (Milestone C), revised RAP preparation and PADEP approval (Milestone D), and preparations leading up to implementation of the RAP (e.g., equipment procurement / installation). For the purposes of this RFB, it is assumed the Milestone E activities will be required for two (2) quarters. However, each bid must specify the number of quarterly events that will be needed prior to implementation of the remedial approach (Milestone F) along with supporting rationale. Any additional quarterly monitoring and reporting events, beyond the two quarters specified in this RFB, shall be defined on the Bid Cost Spreadsheet and shall be incorporated in the Remediation Agreement as per event Optional Cost Adder Milestone E3.[20]

Each groundwater monitoring and sampling event shall include the quarterly compliance sampling network consisting of monitoring wells MW-1 through MW-13, MW-14S, MW-14D, OW-1 and OW-2 (seventeen wells total).[21] The conduct and results of each event shall be documented in quarterly Remedial Action Progress Reports (RAPRs). During each quarterly groundwater monitoring and sampling event, the depth to groundwater shall be gauged in all existing available monitoring points and before purging any of the monitoring points designated above for sample collection. Groundwater level measurements obtained from the monitoring

[19] All figures included in the Revised RAP (e.g., site plan, etc.) shall be available in electronic format to the Solicitor upon request.

[20] The Remediation Agreement includes a Provision that the pre-remedial quarterly site monitoring, sampling & reporting events will be limited to the two quarters under Milestone E plus the number of additional events under Optional Cost Adder Milestone E3 as defined in the selected bid. If additional events are required under Milestone E3, pre-approval from Client and PAUSTIF (for funding) is required.

[21] The fixed price cost shall also include any additional monitoring well(s) that the bidder may propose to install under Milestones A and C (if any).

points shall be converted to groundwater elevations for assessing groundwater flow direction and hydraulic gradient.

Each of the monitoring points designated for sample collection shall be purged and sampled in accordance with the PADEP Groundwater Monitoring Guidance Manual and standard industry practices. Bidders shall manage purged groundwater and other derived IDW generated by the well purging and sampling activities in accordance with PADEP SERO guidance.

Groundwater samples shall be analyzed for the current PADEP short-list of unleaded gasoline and diesel fuel parameters (benzene, toluene, ethylbenzene, xylenes, MTBE, cumene, naphthalene, 1,2,4-TMB and 1,3,5-TMB) by a PADEP-accredited laboratory using appropriate analytical methods and detection levels. Appropriate QA/QC samples shall also be collected during each event and analyzed for the same parameters.[22] In addition, each event shall include field measurements for the following parameters: pH, temperature, specific conductance, dissolved oxygen (measured in-situ), oxidation/reduction potential, and total dissolved solids (TDS).

The RAPRs describing the sampling methods and results will be provided to the PADEP on a quarterly basis and within 30 days of the end of each quarter. At a minimum, each RAPR shall contain the following:

- A summary of site operations and remedial progress made during the reporting period;
- Narrative description of the sampling procedures and results;
- Tabulated data collected from the monitored wells documenting the depth to groundwater and thickness of any free product or any free product emulsion encountered. This data shall be presented on the same table as the historical quantitative groundwater analytical results;
- Groundwater elevation contour maps depicting groundwater flow direction;
- Tabulated historical quantitative groundwater analytical results including results from the current quarter;
- Current quarter laboratory analytical report(s);
- One site-wide iso-concentration contour map for each compound detected in any one well above the SHS during the quarter;[23]

[22] Each bidder's approach to implementing Milestone E shall clearly identify the number of sampling events, number of wells / samples per event, well purging and sampling method(s), QA/QC measures, analytes, purge water management methods, and other key assumptions affecting the bid price.

[23] All figures included in each RAPR (e.g., site plan, groundwater elevation maps, dissolved plume maps, etc.) shall be available in electronic format to the Solicitor upon request.

- For each well exceeding SHS, a graphical depiction of historical key contaminant concentrations and groundwater elevations to provide an assessment of correlations between fluctuating water levels / precipitation events and contaminant concentrations;
- For each well exceeding SHS, a graphical depiction of recent key contaminant concentration trends;
- Discussion of the data to offer an updated assessment whether these data are consistent with a stable, shrinking, or expanding plume;
- Treatment and disposal documentation for waste generated during the reporting period; and
- Demonstration of compliance with the required Federal, State, and local permits and approvals.

PAUSTIF will only reimburse for the necessary quarterly groundwater sampling / reporting events actually completed under this milestone (e.g., this milestone shall be considered completed with the initiation of Milestone F). Each RAPR shall be sealed by a Professional Geologist and / or Professional Engineer registered in the Commonwealth of Pennsylvania (bidders shall refer to state licensing laws to determine which seals are required based on the work performed for and documented in the quarterly RAPRs).

Milestone F – Revised RAP Implementation. Under this milestone, bidders shall provide a fixed-price cost inclusive of all the manpower, machinery, materials, and other costs needed to fully implement the remedial solution for the Site as described in the bidder's Revised RAP, once approved by the PADEP. The cost breakdown for implementing the Revised RAP shall follow the format prescribed by sub-Milestones F1 through F6. Provided below are brief conceptual descriptions for remedial Alternatives #1, #2 and #3 that the bidder may choose from for inclusion in its Revised RAP.

1) **Alternative #1 – Soil Excavation, Application of Oxygen Delivery Product followed by MNA**. Soil excavation will be used to remove source material in the subsurface for off-site disposal. The contamination is relatively shallow, significant organic matter in the shallow subsurface may be holding petroleum contaminants, and source soils are expected to be accessible for excavation in the parking areas. Oxygen Delivery Product shall be added to the downgradient perimeter and hot spots of the excavation for controlled time-release of oxygen to enhance in-situ aerobic bioremediation of petroleum hydrocarbons in groundwater or saturated soils. Contamination beneath structures and beyond the property line will not be excavated. Water management may be necessary; or

2) **Alternative #2 – Air Sparge (AS) / Dual Phase Extraction (DPE)**. With much of the overburden classified as silty sand, air sparge will be used to volatilize petroleum contaminants. Due to shallow groundwater, dual-phase extraction (DPE) will be used to capture hydrocarbon laden sparge air while keeping the shallow water table from mounding in the sparge air recovery / extraction wells under the vacuum conditions. This remedial approach shall consist of installing and operating a network of AS and DPE wells (as determined and described by bidder) to remediate the same area / zone targeted by the soil excavation approach (Alternative #1); or

3) **Alternative #3 – DPE.** Under this alternative, dual-phase extraction (DPE) alone will be used to lower the water table, extract impacted groundwater, and extract volatilized petroleum vapors. This remedial solution shall consist of installing and operating a network of DPE wells (as determined and described by bidder) to remediate the same area / zone targeted by the soil excavation approach (Alternative #1).

Additional information regarding remedial Alternatives #1, #2 and #3 and related bid details for implementation of the Revised RAP are provided in sub-Milestones F1 through F6 below.

Milestone F1 - Installation of AS or DPE Remediation Wells **(Applicable only to bidders selecting Alternative #2 or #3)**. Under this task, bidders shall provide a firm fixed-price cost for installing a network of AS or DPE remediation wells depending on whether the bidder selects remedial Alternative #2 or #3. For the purpose of this RFB, each bidder shall base its bid response on the following:

Alternative #1: Excavation: No remediation wells are anticipated.

Alternative #2: Combination AS / DPE: Each bidder shall specify the number of air sparge wells and DPE wells anticipated to be needed to remediate the area / zone that would otherwise be excavated under Alternative #1 (Figure 4, Appendix 3a).[24] Preliminary well construction details shall also be provided.

Alternative #3: DPE: Each bidder shall specify the number of DPE wells anticipated to be needed to remediate the area / zone that would otherwise be excavated under Alternative #1 (Figure 4, Appendix 3a).[24] Preliminary well construction details shall also be provided.

The borings for the remediation wells shall be advanced using appropriate diameter hollow-stem augers. During drilling activities, bidders shall examine and describe the drill cuttings for lithology, groundwater occurrence and potential staining / odor indicative of hydrocarbon

[24] The design of remediation wells that influence and remediate potentially impacted areas which are adjacent to and underneath the existing garage buildings are encouraged.

contamination.[25] The remediation wells shall be constructed in general accordance with the PADEP Groundwater Monitoring Guidance Manual. Each bid response shall state the drilling methods used to advance the boreholes, the total depth for each well, and well construction details (i.e. well casing diameter, screened interval, sand pack, etc.). Final construction of the remediation wells must ensure that placement of the screened interval will facilitate remediation of the target horizons. When considering the locations and construction of the remediation wells, bidders must take precautions to ensure that no short-circuiting will occur to atmospheric air or more permeable backfill materials (where applicable).

Each bid response shall describe and account for the following in the fixed-price: (i) identifying subsurface utilities and other buried features of concern including, but not necessarily limited to, contacting PA One Call and clearing the borehole locations to a minimum depth of 5 feet using vacuum excavation or hand auger, as necessary; (ii) well development activities; (iii) management of IDW; and (iv) professional surveying of the new well locations and ground surface / top-of-casing elevations. Well drilling / installation and development along with supporting documentation (e.g., waste manifests, boring logs and construction details, etc.) shall be documented in a quarterly RAPR (Milestone G).

The SOW and fixed-price cost for Milestone F1 shall also state / provide the following:

- The remedial design shall take into account existing site constraints such as the transformer and septic field. **Note that extreme caution must be exercised during any intrusive work near the existing infrastructure and building.**

- The remedial design shall take into account the need to avoid generating positive pressure under the existing buildings to avoid potential intrusion of vapors into the buildings.

- A site plan depicting the proposed locations for the remediation wells.

Milestone F2 – In-situ Remedial System Final Design, Equipment Purchase, and Assembly **(Applicable only to bidders selecting Alternative #2 or #3)**. Any equipment[26] that has moving parts or is part of the electronic control system (e.g. pumps, blowers, gauges, electrical sensors & switches) necessary to implement the Revised RAP shall be purchased new, and other equipment (e.g. holding tanks, trailer/shed) is not required to be purchased new provided that such used equipment is guaranteed to properly function for the life of the contract. The remedial system (AS / DPE or DPE) shall be pre-assembled and tested as much as possible as

[25] The collection of soil samples for laboratory analysis will not be required during the drilling activities. Soil sampling to define the contamination can be proposed in Milestone A.
[26] All equipment purchased under this contract will become the property of the Solicitor. The selected consultant shall be responsible for operating and maintaining the equipment for the specified number of years included within their bid beginning from the date of successful remediation system startup.

a turn-key prefabricated system prior to site deployment. Under this approach, the purchased equipment is to be fully integrated and tested electrically and mechanically inside an enclosure (properly insulated with appropriate lighting, heating & ventilation systems) meeting applicable NFPA/NEC codes before being shipped to the site. After delivery and setting in place, final connections shall be made to the electrical service and subsurface piping / conduits installed as part of the Site Preparation Work (see below). Electrical equipment shall meet NEC classification requirements (e.g., Class I, Div 2, where appropriate). According to the Solicitor, the electric supply available at the truck garage service panel is three-phase (60 amps @ 480 volts). Bidders shall consider the compatibility of this type of electrical service with the remediation system equipment proposed for the final system design. Temporary power supply alternatives may be available which would need to be determined through inquiry with the local electric service provider. Clear and legible copies of all equipment manuals and warranties shall be provided to Solicitor.

Bidders shall assume that groundwater treatment will not require an oil-water separator (OWS) or components for metals sequestration. However, should the need for installing an OWS and/or items for metals sequestration potentially become evident during pilot testing under Milestone C or during system operation, this would represent a new condition under an amendment to the Remediation Agreement requiring supporting documentation and Solicitor / PAUSTIF pre-approval. Bidders are encouraged to monitor for free product / emulsion under Milestone C. The magnitude of vapor-phase contaminant mass that will initially be extracted is unclear and shall be estimated under Milestone C above. For the purpose of this RFB, bidders shall assume that two ~300 pound vapor-phase granular activated carbon (VGAC) vessels will be sufficient for treating system off-gas. However, should it be demonstrated that temporary use of a catalytic oxidizer (CatOx) unit may be more efficient / economical to treat system off-gas during the first few months of remedial system operation, based on the vapor-phase contaminant mass being extracted, related costs will be covered under Optional Cost Adder Milestone UC1.

Please note that the proposed remedial system shall be equipped with telemetry. The selected consultant shall coordinate with the telephone, cable or internet service provider to bring and provide appropriate service to the location of the remediation equipment to allow remote communications and document up-time. Payment of the service connection shall be the responsibility of the selected consultant and shall be accounted for in the quoted fixed-price bid.

Milestone F3 – Site Preparation Work. The selected consultant shall obtain all necessary construction and operational permits and/or permit exemptions and post same as required. Solicitor shall be provided copies of all permits / permit exemptions before field construction activities commence. On-site mark-out of buried utilities shall be completed in advance of any drilling, digging, or trenching activities. PA One Call notification shall be made and documented prior to drilling, digging, or trenching activities.

The selected consultant shall coordinate with the electrical service provider to bring and provide appropriate electrical service to the location of the remediation equipment (if necessary). Payment of the electrical service connection shall be the responsibility of the selected consultant and accounted for in the fixed-price bid.

Milestone F4 – In-situ Remediation Equipment Shed / Trailer Location, Trenching, Subsurface Piping, Mechanical, and Electrical **(Applicable only to bidders selecting Alternative #2 or #3)**. Under this task, the selected consultant shall coordinate with the property owner to agree on a suitable area on-property for locating the remedial system shed / trailer, off-gas treatment equipment, etc. For the purpose of this RFB and to avoid business disruption, bidders shall assume that the remediation shed / trailer will be positioned in the grass area adjacent to the pad-mounted transformer located northeast of the truck garage. On the figure requested per Milestone F1 above, bidders shall also depict the proposed location for the remediation equipment compound and the proposed piping / trenching configuration.

Required and appropriately sized piping and electrical conduit/wiring shall be trenched and buried (below the frost line for water conduits) extending between the remediation equipment location and the injection and/or extraction wells, as applicable based on the selected remedial alternative. Buried piping shall be installed with tracer wire to facilitate locating the subsurface lines after the trenches have been backfilled. Buried piping shall be tested for integrity and documented before trench backfilling. Buried piping and conduit stub-ups shall be terminated and secured in the remediation equipment area to facilitate final connections to remediation equipment. Above-grade piping designed to carry or having the potential to carry water shall be properly winterized to prevent freezing and pipe breakage. Surface restoration from all trenching and well head completions shall be similar to current conditions.

Milestone F5 – Final Connections and Startup / Trouble-Shooting of the In-situ Remediation System **(Applicable only to bidders selecting Alternative #2 or #3)**. The selected consultant shall make the final connections between piping / conduit stub ups, power drop / meter and the manifold(s) / conduits on the interior of the pre-assembled and tested treatment system. Any sections of above-grade water piping (as applicable to the type of remedial system) located outside of the equipment enclosure will need to be freeze-protected (e.g., by insulation and heat tracing).

The selected consultant shall start up and demonstrate proper operation of the remediation system equipment, and each bid response shall describe start-up / trouble-shooting procedures. At a minimum, such demonstration shall include written “startup documentation” to the Solicitor and ICF/PAUSTIF that: (a) all below- and above-grade equipment is operational; (b) the design parameters are achievable at the treatment system and at the well heads; (c) all safety and control switches function properly; and (d) the system can operate automatically (without manual intervention). To the extent problems are identified during the site work preparation and/or remediation system installation and start-up phases, the successful bidder shall repair these problems and repeat the proper system operation demonstration.

Also as part of this task, the selected consultant shall prepare an operations and maintenance (O&M) Plan, and as part of the O&M Plan, the selected consultant shall also be responsible for developing a checklist to be completed by field technicians during subsequent O&M visits that will provide key information deemed necessary to evaluate remediation performance, permit compliance, and system maintenance on a continuing basis. Each bid response shall include an appropriate example of an O&M checklist that identifies typical minimum data requirements to be recorded during each O&M site visit.

The selected consultant will provide the Solicitor with a copy of the O&M Plan prior to remediation system startup, and a hard copy of as-built drawings for the remediation system upon completion of the successful system startup.

Bidders shall assume that Solicitor and the PAUSTIF will inspect and confirm that the system has been installed as described in the fixed-price agreement and in the remedial system final design, and is in daily operation as described in the remedial system final design. The selected bidder shall contact ICF/PAUSTIF immediately following completion of start-up / trouble-shooting and when the system is fully operational to schedule an independent inspection visit by PAUSTIF or its agents.

Milestone F6 – Soil Excavation, Transport & Disposal of Impacted Soil and Backfilling - **(Applicable only to bidders selecting Alternative #1).** Each bidder proposing a Revised RAP solution that will involve implementing remedial Alternative #1 shall provide a firm fixed-price cost to complete excavation of soil along with associated backfilling and surface restoration consistent with pre-existing surface conditions.[27] Post-excavation asphalt replacement (driveway and trailer lot) shall consist of a 6-inch thick base coat and a 2-inch thick top coat underlain by an appropriately compacted gravel subbase that is consistent with industry standards.

For the purpose of this RFB, the bidder's fixed-price cost for this Milestone shall assume excavating three areas as shown on Figure 4 provided in Attachment 3a (Area 1: 100'x15'; Area 2: 25'x45'; Area 3: 25'x95'), equivalent to 1,500 in-place cubic yards of soil to a depth of 8 feet below grade, which will require excavation, management, and segregation either for reuse as "clean" backfill or off-property disposal. Should the excavation boundaries need to be expanded based on field screening/ observations and after written consultation with USTIF / ICF, the costs of the added digging, backfilling, surface restoration and management will be addressed via a bid optional unit cost adder (discussed below).[28]

[27] Each bidder should determine, propose, and include in its fixed-price costs the safety measures necessary to appropriately complete the milestone. Excavation work along the building wall will require sloping, shoring, trench boxes, or other measures as appropriate to protect the structure and the successful bidder will be responsible for addressing any damage to the building associated with the bidder's excavation work (at no additional cost).

[28] For the purpose of evaluating the cost component of bid responses proposing Remedial Alternative #1, the volume of soil excavated for off-site disposal, 1,700 tons (assumed fraction of the excavated soil requiring off-property T&D and same amount of clean fill importation) and volume of water requiring off-site disposal (3,000 gallons) have been

Accumulating groundwater during excavation can be expected and will require proper management. Since the volume of impacted groundwater that would require management for disposal cannot be precisely determined at this time, compensation to the successful bidder will be based on a fixed, per gallon unit cost for the management, sampling, loading, transportation and disposal (or on-site treatment & regulatory permitted discharge) of impacted groundwater removed from the soil excavation. The successful bidder will only be reimbursed for the actual gallons of water removed from the excavation and properly disposed. The successful bidder is expected to follow normal industry practices when scheduling the work to avoid conducting excavation activity during precipitation events to the extent possible, and to conduct the excavation and backfilling work as quickly and efficiently as possible to minimize water production.

As previously mentioned, bidders should note that subsurface utilities in the vicinity of the truck garage include, but are not limited to, water, electric, telephone, and a sewer line leading to a septic tank. Utilities are depicted on the Site Plan provided in Attachment 3a. The fixed-price cost for this task shall include costs for the management and / or replacement of any utilities that may be identified and encountered in the excavation. Costs should also include any temporary repairs made prior to permanent replacements.

The bidder's fixed-price cost for this Milestone shall assume Oxygen Delivery Product will be applied to the downgradient perimeter of the excavation to enhance in situ aerobic bioremediation of petroleum hydrocarbons in groundwater or saturated soils. Bidders shall assume that the Oxygen Delivery Product will be applied after excavating the downgradient edge of the soil, before backfilling, and be applied to the bottom and sidewalls of the excavation to aid in reducing contaminant concentrations in both soils and groundwater via enhanced aerobic biodegradation. Each bid shall provide details regarding the proposed manufacturer and product model / composition of the Oxygen Delivery Product, the volume of Oxygen Delivery Product to be used (and basis), and how the Oxygen Delivery Product will be applied.

Fixed-price bids shall also include backfilling and mechanically compacting in lifts the excavated area. The successful bidder shall backfill using a combination of reused "clean" site soil and imported clean fill. Excavated material stockpiled on site for re-use shall be sampled prior to backfilling, and the fixed-price bid shall include costs for the sampling and laboratory work in accordance with PADEP guidance documents. Backfill material and placement/compaction methods shall result in a stabilized soil condition capable of supporting normal traffic and use loads at this manufacturing facility. The backfill materials shall be free of vegetation, lumps, trash, lumber, and other unsuitable materials. In general, backfill shall be mechanically compacted by means of tamping rollers, sheep foot rollers, pneumatic tire rollers, vibrating rollers, or other mechanical tampers which are appropriate for the material being

assumed. The bidder's unit costs for UC4, UC5, and UC6 will be multiplied by the assumed quantities and added to the bidder's base SOW subtotal. The calculated cost will be used for bid scoring purposes (only) and the volumes assumed will not be part of the Remediation Agreement.

compacted. Bids shall also include surface paving and other completion / restoration to restore the area to pre-excavation conditions.

Fixed-price bids for the excavation work shall include any waste profiling (including any sampling & laboratory work) and securing waste facility acceptance prior to beginning the soil excavation.

The SOW and fixed-price cost for Milestone F6 shall state / provide the following:

- Only excessively impacted soil shall be transported and disposed off-site (excavated soil shall be screened with a PID to determine degree of contamination);
- Several monitoring wells are anticipated to be destroyed during the excavation work. These wells will need to be decommissioned in accordance with PADEP guidance as part of this task prior to initiating the excavation. Any destroyed monitoring or observation wells shall be replaced at, or as close as possible to its original location. Construction details for the replacement wells shall be identical, or as close as possible to the original wells;
- A detailed discussion regarding the excavation approach; groundwater management; soil screening and segregation techniques (including the PID screening threshold for determining "clean" versus excessively impacted soil); clean fill sampling and plans for reuse; waste management and profiling; plans for soil staging; the possibility for direct loading of excessively impacted soil; type of backfill; backfilling / compaction methods; plans for surface restoration; records keeping, etc.;
- **A comprehensive and complete fixed-price bid for Milestone F6 that shall *only* <u>exclude</u> the costs for (1) contaminated soil transportation and disposal ($/ton); (2) clean fill importation ($/ton); (3) contaminated water transportation and disposal ($/gal); and (4) expanding the excavation ($/in-place cubic yard).** Bidders shall provide fixed-cost unit rates for these tasks under Optional Cost Adder Milestones UC4, UC5, UC6 and UC7, respectively; and
- A schedule for implementing and completing the excavation work.

The details of the soil removal activities shall be documented in a concurrent quarterly RAPR (Milestone G) and the RACR (Milestone K), and at a minimum shall include the following: scaled drawings depicting the lateral and vertical dimensions of the completed excavation superimposed on the site plan; all field observations and PID readings; the quantity of soil excavated, disposed off-site, used as backfill, and imported for backfill; waste profiling documentation; soil waste disposal manifests and disposal facility; source and amount of imported fill; quantity of added Oxygen Delivery Product and emplacement details, impacted groundwater management, biased soil sampling locations & depths (if any), laboratory analyses, and disposal (if needed); dated photographs taken before breaking ground,

throughout the excavation, and after restoration; and documentation (boring logs / well construction diagrams and survey information) for any replacement monitoring wells.

Milestone G – Remediation System O&M (Alternative #2 and #3) and Groundwater Monitoring, Sampling & Reporting (Alternatives #1, #2, and #3). For this milestone, bidders shall provide the Solicitor and PAUSTIF with firm quarterly fixed-price unit costs that would include routine O&M of the AS / DPE (Alternative #2) or DPE (Alternative #3) remedial system,[29] quarterly groundwater monitoring and sampling of the monitoring well network, and reporting (Alternatives #1, #2, and #3). The quarterly fixed price cost shall also include responding to any unexpected telemetry-triggered O&M visits.
For the purpose of this RFB, it is assumed the Milestone G remedial system O&M activities will be required for:

Alternative #1: 0 quarters of remediation O&M; 1 year of post-excavation MNA Groundwater Monitoring, Sampling & Reporting;
Alternative #2: 8 quarters (2 years) remediation; or
Alternative #3: 12 quarters (3 years) remediation.

However, each bid *must* specify the remediation timeframe (i.e., number of O&M quarters) that the bidder's proposed remedial approach will need in order to achieve the project goal of demonstrating stability of the contaminant plume and reducing soil and groundwater contaminant concentrations to below SSS risk-based numeric values, enabling initiation of groundwater attainment demonstration.[30,31] The bidder's realistic assessment of remediation timeframe (total number of operating quarters) shall be defined on the Bid Cost Spreadsheet and shall include the additional number of remediation quarters, beyond assumed quarters specified in this RFB (e.g., if a bidder believes it can complete the remediation in a total of 12 quarters of O&M when the RFB assumed quarters is 8, then the additional number of quarters to be included on the Bid Cost Spreadsheet is four (4) quarters). If the bidder's O&M remediation timeframe exceeds the RFB assumed quarters, the number of quarters exceeding the RFB assumption will be incorporated in the Remediation Agreement as Optional Cost Adder Milestone G9 through G*n* or G13 through G*n* (Alternatives #2 and #3, respectively). Bidders shall assume that the remediation will need to continue until the "proposed remediation endpoints" for OW-2, MW-10, and MW-11 have been met for at least two consecutive quarterly monitoring and sampling events. Under these conditions, it is deemed reasonable to initiate the

[29] Electric usage; telephone, cable, internet service; and any discharge to the local treatment facility will be reimbursed as time-and-material cost adders to the Remediation Agreement.
[30] During the bidder's specified timeframe of site operations, maintenance, and monitoring subsequent to remediation system startup, the selected consultant, at its own expense, including **all** associated labor, shall be responsible for repairing or replacing equipment purchased for the Revised RAP implementation that becomes damaged, destroyed, or defective.
[31] If the groundwater data allows for discontinuing remedial activities prior to reaching the bidders specified timeframe for remedial system operation, the selected consultant will only be reimbursed for O&M events that have been completed.

groundwater attainment demonstration. Each bid must explicitly state the bidder's understanding of the project goal for when O&M of the remedial system would be discontinued and attainment sampling shall begin.

If the Consultant decides to discontinue O&M activities before all 8 (Alternative #1 or #2) or all 12 (Alternative #3) Milestone G quarterly events are completed in order to initiate groundwater attainment early, the Consultant will bear some risk if groundwater contaminant concentrations rebound during subsequent attainment monitoring. More specifically, if the remedial system is shut down before all of the Milestone G quarterly events are completed, the Consultant will be required to wait a minimum of two months before initiating post-remediation groundwater sampling and reporting activities (Milestone I). If during the first quarter of groundwater attainment, concentrations of contamination rebound above SSS numeric standards, the Consultant shall be obligated to restart the system within 7 days and continue with the residual quarterly Milestone G activities. Then, **when all the RFB assumed O&M quarters of the Milestone G activities have been completed (plus any or all of the Cost Adder Milestone G quarters) and groundwater attainment activities are re-initiated, the Consultant who initially pre-maturely idled the remediation system will be obligated to perform the first of the restarted series of quarterly attainment events at no cost**. Responsive bids will explicitly state an understanding of the possible consequences of early termination of the RFB assumed quarters of O&M under Milestone G.

Each bid must specify the number of site visits to occur each quarter. O&M tasks will be primarily focused on data collection and evaluations to: (1) determine, demonstrate, and document remediation performance; (2) properly maintain the system equipment; and (3) demonstrate compliance with permits and other applicable regulatory requirements.

- *Performance monitoring* shall include data collection and evaluations geared toward evaluating how well the remedial strategy is working and making necessary adjustments to the system operational configuration to optimize system performance. As applicable, depending on the type of remediation system installed, performance monitoring activities are to include, but not necessarily be limited to, measurements that: i) show the design vacuum, air pressure and vapor flow rate is achieved at the injection / extraction well heads; ii) demonstrate the target zone of contamination is being pneumatically and hydraulically influenced; and iii) provide for contaminant mass recovery quantification. The selected consultant shall report quarterly concerning its evaluations of system performance and system optimizations performed.

- *System maintenance & related monitoring* shall include monitoring and routine maintenance as specified by the equipment manufacturer(s) to ensure warranties are not voided and the equipment is kept in good working order. Operational time shall be logged by system instrumentation and reported quarterly to the Solicitor.

The selected consultant is expected to maintain at least an 85% uptime on the system during each quarter. Failure to meet this minimum expectation over two consecutive quarters will constitute, at the Solicitor's sole discretion, a breach of contract and the Solicitor may choose to terminate the contract.

- *Compliance monitoring* shall include system and site sampling needed to demonstrate compliance with permits and other applicable regulatory requirements. Documentation of compliance shall be provided to the Solicitor in quarterly RAPRs and in any other reporting required by permitting agencies (i.e. local POTW).

The quarterly groundwater sampling events shall include the seventeen compliance monitoring points previously identified under Milestone E (MW-1 through MW-13, MW-14S, MW-14D, OW-1 and OW-2) and any additional monitoring well(s) the bidder proposed to install under Milestones A and C. Note, however, that the depth to groundwater shall continue to be gauged in all existing and available on- and off-property monitoring points during each quarterly event.

During each event, the depth to groundwater and any potential FPH shall be gauged in all available monitoring points prior to purging and sampling. Groundwater level measurements obtained from the monitoring points shall be converted to groundwater elevations for assessing groundwater flow direction and hydraulic gradient. The conduct and results of each event shall be documented in RAPRs. Bidders shall manage purged groundwater and other derived IDW generated by the purging and sampling activities in accordance with the PADEP SERO guidance.

Groundwater samples shall be analyzed for the current PADEP short-list of unleaded gasoline and diesel fuel parameters (benzene, toluene, ethylbenzene, xylenes, MTBE, cumene, naphthalene, 1,2,4-TMB and 1,3,5-TMB) by a PADEP-accredited laboratory using appropriate analytical methods and detection levels. Appropriate QA/QC samples shall also be collected during each event and analyzed for the same parameters.[32] In addition, each event shall include field measurements for these water quality parameters: pH, temperature, specific conductance, dissolved oxygen (measured in-situ), oxidation / reduction potential, and TDS.

The RAPRs describing the sampling methods and results will be provided to the PADEP on a quarterly basis and within 30 days of the end of each quarter. At a minimum, each RAPR shall contain the following:

- A summary of site operations and remedial progress made during the reporting period, including vapor- and dissolved-phase contaminant mass recovery

[32] Each bidder's approach to implementing Milestone G shall clearly identify the number of sampling events, number of wells / samples per event, well purging and sampling method(s), QA/QC measures, analytes, purge water management methods, and other key assumptions affecting the bid price.

estimates (as applicable depending on the type of remediation system installed;

- Narrative description of the sampling procedures and results;
- Tabulated data collected from the monitored wells documenting the depth to groundwater and thickness of any free product or any free product emulsion encountered. This data shall be presented on the same table as the historical quantitative groundwater analytical results;
- Groundwater elevation contour maps depicting groundwater flow direction;
- Tabulated historical quantitative groundwater analytical results including results from the current quarter;
- Current quarter laboratory analytical report(s);
- One site-wide iso-concentration contour map for each compound detected in any one well above the SHS during the quarter;[33]
- For each well exceeding SHS, a graphical depiction of historical key contaminant concentrations and groundwater elevations to provide an assessment of correlations between fluctuating water levels / precipitation events and contaminant concentrations;
- For each well exceeding SHS, a graphical depiction of recent key contaminant concentration trends;
- Discussion of the data to offer an updated assessment whether these data are consistent with a stable, shrinking, or expanding plume;
- Evaluation of system performance including contaminant mass recovery quantification and system optimizations performed;
- Operational time shall be logged by system instrumentation and reported in the RAPRs. If less than 85% uptime has been achieved, documentation of operational problems shall be provided along with the changes / modifications implemented to improve performance consistency;
- Treatment and disposal documentation for waste generated during the reporting period; and
- Demonstration of compliance with the required Federal, State, and local permits and approvals.

PAUSTIF will only reimburse for the necessary quarterly O&M and groundwater sampling / reporting events actually completed under this milestone (e.g., this milestone shall be

[33] All figures included in each RAPR (e.g., site plan, groundwater elevation maps, dissolved plume maps, etc.) shall be available in electronic format to the Solicitor upon request.

considered completed with the initiation of Milestone I – Post-Remediation Groundwater Monitoring and Reporting). If, in order to achieve the cleanup goals, it is necessary to extend the period of O&M beyond the RFB-specified number of quarters, each additional quarter, up to the total number of Consultant's bid O&M remedial timeframe, will be addressed via Optional Cost Adder Milestone G9 through G*n* or G13 through G*n*. Consultant shall seek and obtain written approval from Solicitor and PAUSTIF to continue operation of the remedial system (Milestone G9 through G*n* or G13 through G*n*).[34]

Each quarterly RAPR shall be signed and sealed by a Professional Geologist and / or Professional Engineer registered in the Commonwealth of Pennsylvania (bidders shall refer to state licensing laws to determine which seals are required based on the work performed for and documented in the RAPR).

To provide added incentive for the successful bidder to regularly scrutinize remedial system performance and optimize system operations for maximal efficiency in completing the remedial O&M to achieve closure as expeditiously and cost effectively as possible, **10% of each quarterly payment for this milestone (and Optional Cost Adder Milestone G9 through G*n* or G13 through G*n*, if implemented) will be withheld and accumulated pending successful completion of remediation and initiation of groundwater attainment activities (Milestone I).** When this condition has been met, the accumulation of 10% holdback payments, for the Milestones actually completed, will be reimbursed in one lump sum to the successful bidder.[35] The 10% hold-back milestone will not be paid for an in-situ remediation system that has not attained the cleanup goal within the Consultant's bid remediation timeframe.

Milestone H - Performance Evaluation of RAP Remedial Approach (Alternatives #1, #2, and #3). Under this milestone, the selected bidder shall complete a performance evaluation of the remedial approach proposed in its PADEP-approved RAP. The performance evaluation shall determine if the remedial approach is efficiently and effectively remediating residual adsorbed- and dissolved-phase contamination and achieving the intent of the RAP design. The remedial performance evaluation shall be conducted within 6 to 9 months (i.e., two to three quarters) after the selected bidder has fully implemented the proposed site remedy. Milestone H shall culminate in a written report presenting the testing performed, conclusions reached and recommendations to address all discovered deficiencies and to improve remediation effectiveness. Recommendations may include both changes to operations and modifications / augmentations to the remedial design. All recommendations shall include estimated costs to implement and Solicitor may decide to accept or reject any or all recommendations. Should the selected consultant identify deficiencies and recommend actions to optimize remedial effectiveness, and the stakeholders agree with the necessity and appropriateness of one or

[34] The Remediation Agreement includes a Site Specific Assumption that remediation will be complete and groundwater attainment activities will be initiated within the O&M timeframe Consultant has bid.
[35] Lump sum payment request shall be made prior to the on-set of initiating groundwater attainment activities.

more of the recommendations, then enabling contracting mechanisms will be explored at that time.

More specifically, the purposes of the performance evaluation shall include a critical analysis of:

- Hydraulic and pneumatic influence measurements, as applicable, for the operating in-situ remediation system to ensure the RAP design is being achieved;

- Quantified dissolved- and vapor-phase contaminant mass recovery estimates, as applicable;

- Changes in groundwater quality and chemistry; and

- How the remedial approach is working relative to the plan and any deficiencies / planned corrective measures.

The bidder shall provide a detailed description of the: i) proposed performance evaluation and rationale for testing; ii) proposed methods; iii) use of existing or installation of new data monitoring/collection points; iv) proposed equipment to be used; and v) data that is proposed to be collected. Each bid shall also describe how the data/information would be evaluated.

Please note that all bidders shall propose conduct of a remedial performance evaluation for the selected site remedy. In particular, the selected bidder shall evaluate conditions in the source area and at MW-11, which is a key compliance well that will only be influenced indirectly by Alternatives #1, #2, or #3.

The Milestone H proposal shall reflect an understanding that the selected bidder will prepare a draft and final version of the Remedial Performance Evaluation Report (RPER) for Solicitor and ICF/PAUSTIF independent engineering review and comment. The final RPER shall show that the performance evaluation testing was conducted according to the selected consultant's bid and shall constitute documentation for payment of Milestone H. As previously discussed, the RPER shall include recommended actions to address any operational deficiencies or remedial ineffectiveness / inefficiencies along with implementation capital and operational cost addition or reduction estimates. The written report shall be provided to Solicitor and PAUSTIF for review within three months of completing the remedial performance evaluation and shall serve as the basis for making decisions on the need for optimization of the remedial approach. Again, if the stakeholders agree that one or more of the recommendations are reasonable, necessary and appropriate, enabling contracting mechanisms will then be considered. The Milestone H activities shall also be reported in a concurrent RAPR.

Milestone I – Post-Remediation Groundwater Monitoring and Reporting. Under this task, bidders shall provide a firm fixed-price to complete eight quarters of groundwater monitoring and

sampling events to generate the data needed to demonstrate stability of the contaminant plume(s) as part of the SSS closure and to confirm SSS numerical standards have been achieved. Each groundwater monitoring and sampling event shall include existing wells MW-1 through MW-13, MW-14S, MW-14D, OW-1 and OW-2.[36] The conduct and results of each event shall be documented in quarterly RAPRs. If additional quarterly events would be needed beyond eight quarters, Consultant shall seek and obtain written approval from Solicitor and PAUSTIF to continue with up to an additional four quarters which are incorporated in the Remediation Agreement as Optional Cost Adder Milestone I.

During each quarterly post-remediation groundwater monitoring and sampling event, the depth to groundwater shall be gauged in all existing available monitoring points and prior to purging any of the designated monitoring wells for sampling. Groundwater level measurements obtained from the monitoring points shall be converted to groundwater elevations for assessing groundwater flow direction and hydraulic gradient.

Each of the monitoring wells designated for sample collection shall be purged and sampled in accordance with the PADEP Groundwater Monitoring Guidance Manual and standard industry practices. Bidders shall manage purged groundwater and other derived IDW generated by the well purging and sampling activities in accordance with the PADEP SERO guidance.

Groundwater samples shall be analyzed for the current PADEP short list of unleaded gasoline and diesel fuel parameters (benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, cumene, 1,2,4-TMB and 1,3,5-TMB) by a PADEP-accredited laboratory using appropriate analytical methods and detection levels. Appropriate QA/QC samples shall also be collected during each event and analyzed for the same parameters.[37] In addition, each event shall include field measurements for the following parameters: pH, temperature, specific conductance, dissolved oxygen (measured in-situ), oxidation / reduction potential, and TDS.

The post-remediation groundwater monitoring reports describing the sampling methods and results shall be provided to the PADEP on a quarterly basis and within 30 days of the end of each quarter. At a minimum, each quarterly report shall contain the following:

- A summary of site operations and remedial progress made during the reporting period;
- Narrative description of the sampling procedures and results;
- Tabulated data collected from the monitored wells documenting the depth to groundwater and thickness of any free product or any free product emulsion

[36] The fixed price cost shall also include any additional monitoring wells installed under Milestones A or C.
[37] Each bidder's approach to implementing Milestone I shall clearly identify the number of sampling events, number of wells / samples per event, well purging and sampling method(s), QA/QC measures, analytes, purge water management methods, and other key assumptions affecting the bid price.

encountered. This data shall be presented on the same table as the historical quantitative groundwater analytical results;

- Groundwater elevation contour maps depicting groundwater flow direction;
- Tabulated historical quantitative groundwater analytical results including results from the current quarter;
- Current quarter laboratory analytical report(s);
- One site-wide iso-concentration contour map for each compound detected in any one well above the SHS during the quarter;[38]
- For each well exceeding SHS, a graphical depiction of historical key contaminant concentrations and groundwater elevations to provide an assessment of correlations between fluctuating water levels / precipitation events and contaminant concentrations;
- For each well exceeding SHS, a graphical depiction of recent key contaminant concentration trends and results of any qualitative and quantitative analysis;
- Discussion of the data to offer an updated assessment whether these data are consistent with a stable, shrinking, or expanding plume;
- Treatment and disposal documentation for waste generated during the reporting period; and
- Demonstration of compliance with the required Federal, State, and local permits and approvals.

Each post-remediation groundwater monitoring report shall be sealed by a Professional Geologist and / or Professional Engineer registered in the Commonwealth of Pennsylvania (bidders shall refer to state licensing laws to determine which seals are required based on the work performed for and documented in the groundwater attainment demonstration report).

Milestone J – Plume Stability Assessment (Alternatives #1, #2, and #3). Under this task, bidders shall provide a fixed-price cost and describe their approach in detail for evaluating the groundwater data and demonstrating contaminant plume stability. This work is anticipated to include evaluating contaminant trends in individual wells and performing both a quantitative (e.g., Mann-Kendall statistical analyses) and qualitative (e.g. chronological contaminant extent maps, trend lines, etc.) evaluation to address all dissolved-phase constituents whose concentrations exceed the non-residential used aquifer SHS. The plume stability assessment

[38] All figures included in each RAPR (e.g., site plan, groundwater elevation maps, dissolved plume maps, etc.) shall be available in electronic format to the Solicitor upon request.

shall be conducted after Milestone I has been completed.[39] The fixed-price cost shall include documenting the plume stability assessment in the RACR (Milestone K).

Bid responses will be expected to describe how the preponderance of data would be used to assess the nature of overall plume stability with the recognition there may be localized perturbation of constituent concentrations (e.g., due to groundwater fluctuations in the plume core) that may or may not be a reflection of the stability of the plume as a whole. Bidders are expected to provide a description of how plume stability will be evaluated qualitatively (e.g., using a sequence of plume limit contours chronologically over the post-remedial period to evaluate if the plume generally remains in the same area over time). Additionally, if quantitative statistics are proposed to be used by bidders (e.g., Mann-Kendall) to supplement a qualitative evaluation, bidders shall describe these techniques and how any difference between qualitative analysis and quantitative analysis will be resolved.

Milestone K – Preparation, Submittal and PADEP Approval of Remedial Action Completion Report (RACR). Under this milestone, the bidder will provide a fixed-price cost to prepare a draft and final RACR following the completion of Milestones E through I and related optional cost adder milestones, as necessary. The RACR shall be prepared in accordance with Section 245.313. At a minimum, the RACR shall provide the details for Milestones A through I, and any optional cost adder milestones. The RACR shall also discuss the selected closure criteria for the site, provide proof of soil and groundwater attainment, and request permanent closure for the site for the current release under an Act 2 Relief of Liability (ROL). The project schedule should allow two (2) weeks for Solicitor and PAUSTIF review and comment on the draft RACR before a final version is submitted to the PADEP. The selected consultant shall then prepare and submit the final RACR to the PADEP in accordance with Section 245.313, and the report shall be sealed by a Professional Geologist and / or Professional Engineer registered in the Commonwealth of Pennsylvania (bidders shall refer to state licensing laws to determine which seals are required based on the work performed and documented in the RACR). The fixed-price cost shall also include addressing any PADEP comments on the RACR.

The successful bidder will be eligible to receive payment for 75% of the bid amount for Milestone K when there is proof the document has been completed and submitted to PADEP. The 25% balance will be due for reimbursement once proof has been provided that PADEP has approved the Milestone K deliverable document.

Milestone L – Finalizing / Filing of Environmental Covenants. Under this task, the bidder shall describe and provide a fixed-price bid for finalizing and filing the Environmental Covenant (EC) associated with the PAUSTIF eligible release. The fixed-price shall include all reasonable and necessary activities and required fees to finalize and file the EC for the subject property,

[39] If it becomes evident anytime during the groundwater plume stability demonstration that plume stability will not be successful within the eight quarters plus four additional quarters under Optional Cost Adder Milestone I, this will represent a New Condition under the contract.

with the local court house and other required entities. The successful bidder will be responsible for coordinating this work with the impacted property owner(s) and their legal counsel(s). Legal fees are not to be included in bid costs. PAUSTIF reimbursement of Solicitor and/or third party legal fees will be considered outside of the executed Remediation Agreement. The fixed price cost for this task shall also include the work necessary in petitioning PADEP for any relevant EC waivers.

Milestone M – Site Closure / Restoration Activities. Under this milestone, the bidder shall describe and provide a fixed-price bid for properly closing the site, including: removal of the remedial system (Alternative #2 or #3) and proper disposal of any remaining wastes; in-place abandonment of remedial system below grade piping; in-place abandonment of monitoring wells, piezometers, remediation wells, and soil vapor sampling points consistent with PADEP guidelines; well head removals; and surface re-vegetation and concrete / asphalt repairs, as applicable, for areas that have been disturbed by site characterization or remedial action activities. This milestone shall also include photo–documenting the site restoration work and completing well abandonment forms to be submitted to the appropriate regulatory agencies. Copies of these photographs and forms shall also be provided for the Solicitor's files.

Each bid shall specify the estimated number of days between PADEP approval of the RACR and initiating the Milestone M site restoration work. Site restoration activities shall be conducted in accordance with standard industry practices and applicable laws, regulations, guidance, and PADEP directives. Conduct of all site closure / restoration activities shall be coordinated with the Solicitor and property owner.

The selected consultant shall determine whether the Solicitor wishes to maintain any components of the remedial system, as applicable, before removing them from the Site.

Optional Cost Adder Milestones

A number of optional cost adders may come into play at this site. Therefore, bidders shall provide unit pricing for these contingencies outside the base RFB scope. Note that before any work associated with these unit cost adders is conducted, the selected consultant shall provide a written request and detailed technical explanation for USTIF / ICF and its agent's technical review and consideration ahead of any written authorization to proceed.

Optional Cost Adder Milestone E3 – Per Event Additional Pre-Remediation Quarterly Groundwater Monitoring, Sampling & Reporting. Under this milestone, bidders shall provide the Solicitor and PAUSTIF with a firm quarterly fixed-price unit cost that would include the quarterly groundwater monitoring, sampling, analysis, and reporting beyond the two quarters specified in Milestone E. The SOW for this unit cost adder milestone shall follow Milestone E guidelines. Technical justification will be required by the selected consultant prior to implementing this optional cost adder milestone.

Optional Cost Adder Milestone G9 through G*n* or G13 through G*n* – Additional Remediation System O&M and Groundwater Monitoring, Sampling, & Reporting. Under this milestone, bidders shall provide the Solicitor and PAUSTIF with a firm quarterly fixed-price unit cost that would include routine O&M of the remedial system, quarterly groundwater monitoring and sampling of the on- and off-property monitoring wells, and reporting beyond the timeframe specified in Milestone G. The SOW for this unit cost adder milestone shall follow Milestone G guidelines. As described in Milestone G, a 10% holdback will be applied to each Optional Cost Adder Milestone G payment. Technical justification will be required by the selected consultant prior to implementing this optional cost adder milestone.

Optional Cost Adder Milestone I9 through I12 – Additional Post-Remediation Groundwater Monitoring and Reporting. Under this milestone, bidders shall provide the Solicitor and PAUSTIF with a firm quarterly fixed-price unit cost that would include the quarterly groundwater monitoring, sampling, analysis, and reporting beyond the eight quarters specified in Milestone I. The SOW for this unit cost adder milestone shall follow Milestone I guidelines. Technical justification will be required by the selected consultant prior to implementing this optional cost adder milestone.

Optional Cost Adder Milestone N – Post-Remediation Risk Assessment with Fate & Transport Modeling. Under this milestone, bidders shall provide a firm fixed-price cost to update the baseline risk assessment contained in the revised SCR (Attachment 3c) based on **current and forecasted future** residual contaminants in soil, groundwater, and vapors following remediation.[40] The Post-Remediation Risk Assessment with Fate & Transport Modeling shall be conducted after the plume stability analysis described in Milestone J **only** if the selected bidder seeks and obtains written approval from Solicitor and PAUSTIF by demonstrating this Milestone is necessary.

This task shall include updating the exposure pathway analysis to determine potentially complete and incomplete exposure pathways. This shall be followed by a risk assessment process that begins by comparing current and projected future residual soil & groundwater contaminant levels against applicable soil & groundwater screening criteria[41]. For those soil and groundwater contaminants passing through the screening criteria, the human health exposure risks shall be quantified. If human health risks are excessive (organ-specific HI >1 and /or carcinogenic risk of >1 x 10-4), then appropriate land use restrictions for the spill property shall be identified to eliminate the pathway causing the excessive human health risk. After the conduct of the remediation proposed by the selected consultant in Milestone F, should

[40] If the Vapor Intrusion Study under Milestone B (completed before remediation) indicates excess vapor intrusion risks, then conduct of a post-remediation vapor intrusion study would be considered a New Condition under the contract.

[41] Based on discussions with the PADEP, constituent concentrations are to be screened against the USEPA RSLs and not against the PADEP Statewide Health Standards (SHS). Only those constituents that do not screen out against the risk-based screening levels remain as COPCs for the exposure pathway analysis and for demonstrating attainment of the PADEP SHS or a risk-based numeric Site Specific Standard.

excessive human health risks continue to persist at on-property or off-property parcels, then this would represent a New Condition under the contract. Any further remediation of the property or other off-site properties would need to be conducted either through a contract modification or through other means.

As with the baseline risk assessment presented in the revised SCR (Attachment 3c), the updated risk assessment shall encompass updating the exposure assessment, toxicity assessment, and risk characterization. The identification of exposure pathways for the Site shall be based upon guidance from the American Society for Testing and Materials (ASTM) and the United States Environmental Protection Agency (USEPA), as required by Act 2, Section 250.404. The risk assessment deliverable shall include Exposure Pathway Flowcharts graphics for current and future potential pathways to support the risk assessment text. These charts shall graphically depict the thought process in identifying the potentially complete pathways. The exposure evaluation charts shall include the exposure pathway steps of Constituent Source, Receiving Media, Transport Mechanisms, Exposure Routes and current and future human receptors (i.e., facility workers, construction workers, trespassers, residents, and recreational users and others).

The post-remediation risk assessment shall identify the current and forecast future site soil and groundwater samples used in the risk assessment, show how the constituents of interest (COI) were identified and present the COI for each contaminated media with a potentially complete pathway to a human receptor. Additionally, the risk assessment shall show how the risk assessment exposure point concentrations (EPCs) were calculated[42] for each contaminated media with a potentially complete human exposure pathway and summarize the calculated EPCs.

For each potentially complete exposure pathway, the level of carcinogenic risk shall be quantified, and the total cumulative carcinogenic risks shall be calculated. Non-carcinogenic risks shall be calculated using the hazard index. If necessary, the hazard index shall be evaluated on an organ specific basis. Exposure and toxicity assumptions shall be presented and well documented in the risk assessment report along with an uncertainty analysis.

The updated on-site human health risks shall be assessed in order to determine what pathway elimination land use restrictions may / may not be required for the spill site. For example, the successful bidder shall determine which of the following on-site restrictions or others would be necessary to reduce the human health risks to acceptable levels.

- No potable water wells;
- No residential land use;

[42] EPCs shall be derived for COIs by statistical analysis (maximum concentrations shall not be used for EPCs).

- Vapor barrier on future building construction;
- Vapor mitigation (engineering control) on existing structures (e.g., radon type venting) if current vapor intrusion risks are excessive[43]; and
- Soil management plan for future digging on excessively contaminated portions of property.

Bidders shall assume that no environmental covenants / land use restrictions will be implemented at adjoining off-property locations and that no post-remedial care inspections of the off-site properties will be needed due to the anticipated successful remediation.

In addition, an ecological screening assessment shall be updated to determine if the site poses an unacceptable risk to ecological receptors. The screening assessment shall be conducted in accordance with Section IV.H of the Pennsylvania Land Recycling Program's Technical Guidance Manual and USEPA Region 3 risk assessment screening criteria insofar as is necessary for determining any potential ecological risk.

Current post-remediation risks for on- and off-property areas shall be evaluated using post-remediation data. Future off-property concentrations of groundwater contamination inputs to the post-remediation risk assessment shall be forecasted using groundwater contaminant fate and transport modeling. Although residual post-remediation human health risks may be found to be within an acceptable range, chemical transport via groundwater could create a future off-property excessive risk. This milestone will determine whether post-remediation migration of on-property contamination would produce an excessive off-property risk in the future. PADEP's New Quick Domenico model may be appropriate for this site because groundwater appears to be present in the unconsolidated natural soils; however, prior to implementing this task, the selected consultant shall contact the PADEP project officer for his/her input on the type of modeling to be performed.[44] The fixed-price cost shall include documenting the fate and transport modeling effort in the RACR (Milestone K), including providing all model input/output; providing a thorough explanation of model construction, justifying all input parameters, and discussing the modeling results and conclusions in detail with respect to assessing current and predicted future plume stability.

After completing the exposure analysis / risk assessment, the selected consultant will present its draft findings to the Solicitor and PAUSTIF for review and comment as a separate deliverable. The project schedule should allow two (2) weeks for Solicitor and PAUSTIF to review the draft Risk Assessment before being finalized and incorporated into the RACR (Milestone K).

[43] If vapor mitigation is required on current commercial buildings, the design and implementation of such VI mitigation system would be considered a New Condition under the contract.
[44] Should the PADEP subsequently disagree, this new requirement will constitute a "new condition" under the Fixed-Price Agreement.

Optional Cost Adder Milestone CA1 through CA*n* – Monthly Utilities & Discharge Fees. Bidders shall utilize this optional cost adder milestone for invoicing "as-billed" time and materials costs incurred for utilities (e.g., electric, telephone) or POTW discharge fees on either a monthly or quarterly basis, as appropriate.

Optional Cost Adder Milestone UC1 – Temporary Operation of CatOx Unit. Under this milestone, bidders shall provide a firm fixed-price unit cost incorporating charges for delivery and subsequent return of a CatOx unit, installation and removal of the CatOx unit from the remedial system, and CatOx unit rental and operational charges (e.g., electric usage) for a period of three months. Before implementing this optional milestone, Consultant must provide system data to PAUSTIF and Solicitor demonstrating the need for a CatOx unit and shall secure PAUSTIF/Solicitor approval. The fixed-price unit cost shall be inclusive of all labor, subcontractor costs, any permitting fees, and waste handling / disposal items. Bidder's shall also identify the mass recovery rate threshold / criterion for switching from CatOx treatment to VGAC (e.g., once TPH as gasoline mass recovery rates decrease to below X pounds per day, the CatOx unit will be replaced with VGAC).

Optional Cost Adder Milestone UC1A – Additional Months of CatOx Unit Rental. Bidders shall utilize this optional cost adder milestone for invoicing monthly rental of the CatOx unit beyond the period of three months specified under Optional Cost Adder Milestone UC1 above. Any additional months of CatOx rental beyond the three months specified under Milestone UC1 will require PAUSTIF/Solicitor approval and shall adhere to the unit costs specified for Milestone UC1 in the Remediation Agreement. Note that charges for delivery and subsequent return of the CatOx unit, and installation / removal of the CatOx unit from the remedial system, will be fully captured under Milestone UC1.

Optional Cost Adder Milestone UC2 – LGAC Change-Out. Under this milestone, bidders shall provide a firm fixed-price unit cost for each LGAC change-out event of the "primary" LGAC vessel, placing the vessel with the fresh virgin GAC in the secondary position. Bidders shall detail the size of the LGAC units (pounds / type of GAC), scope of work and provide the criteria or "trigger(s)" that would be used in determining when the LGAC needs to be replaced (e.g., once the carbon in the LGAC unit has adsorbed 15% of its weight in TPH as gasoline contamination determined by mass recovery calculations). The fixed-price cost shall be inclusive of all labor, subcontractor costs, LGAC replacement, and waste handling / disposal items.

Optional Cost Adder Milestone UC3 – VGAC Change-Out. Under this milestone, bidders shall provide a firm fixed-price unit cost for each VGAC change-out event of the "primary" VGAC vessel, placing the vessel with the fresh virgin GAC in the secondary position. Bidders shall detail the size of the VGAC units (pounds / type of GAC), scope of work and provide the criteria or "trigger(s)" that would be used in determining when the VGAC needs to be replaced (e.g., once the carbon in the VGAC unit has adsorbed 15% of its weight in TPH as gasoline

contamination determined by mass recovery calculations). The fixed-price cost shall be inclusive of all labor, subcontractor costs, VGAC replacement, and waste handling / disposal items.

Optional Cost Adder Milestone UC4 – Contaminated Soil Transportation and Disposal. Under this milestone, bidders shall provide a firm fixed-price unit cost ($/ton) for transporting and disposing excessively contaminated soil (from Milestone F activities) at a facility approved for accepting this waste stream.

Optional Cost Adder Milestone UC5 – Clean Fill Importation. Under this milestone, bidders shall provide a firm fixed-price unit cost ($/ton) for importing clean fill material for use in backfilling the excavation. The imported clean fill will be used to supplement any excavated soil (Alternative #1 / Milestone F) that is determined to be suitable for reuse based on sampling and laboratory analysis.

Optional Cost Adder Milestone UC6 – Contaminated Water Transportation and Disposal. Under this milestone, bidders shall provide a firm fixed-price unit cost ($/gallon) for transporting and disposing contaminated water at a facility approved for treating this waste stream (associated with Alternative #1, Milestone F).

Optional Cost Adder Milestone UC7 – Expansion of Soil Excavation. Under this milestone, bidders shall provide a firm fixed-price unit cost ($/in-place cubic yard) should expansion of the Alternative #1, Milestone F soil excavation beyond the dimensions / volume assumed in this RFB become necessary as warranted by field screening and other appropriate observations.

Additional Information

In order to facilitate PAUSTIF's review and reimbursement of invoices submitted under this claim, the Solicitor requires that project costs be invoiced by the milestone identified in the executed Remediation Agreement. Actual milestone payments will occur only after successful and documented completion of the work defined for each milestone. The selected consultant will perform only those tasks/milestones that are necessary to reach the Objective identified in this RFB. Selected consultant will not perform, invoice, or be reimbursed for any unnecessary work completed under a milestone.

Any "new conditions", as defined in Attachment 1, arising during the execution of the SOW for any of the milestones may result in termination of, or amendments to, the Remediation Agreement. Modifications to the executed Remediation Agreement will require the written approval of the Solicitor and the PAUSTIF (for funding consideration). PADEP approval may also be required.

List of Attachments

1. Remediation Agreement
2. Bid Cost Spreadsheet
3. Site Information/Historic Documents
    a. Aerial Image and Site Plans
    b. UST Closure Report_July 1997
    c. Revised SCR_June 2016
    d. RAP_March 2017
    e. PADEP RAP Approval Letter_June 14, 2017
    f. Phase II ESA Report_November 17, 2014
    g. Third Quarter 2018 RAPR