



May 20, 2019

Mr. Tom Coar
Environmental Group Manager
Environmental Cleanup and Brownfields Program
Pennsylvania Department of Environmental Protection
2 Public Square
Wilkes-Barre, PA 18701-1915

VIA CERTIFIED MAIL #7018 0360 0002 1968 1752

**RE: Remedial Action Plan Addendum:
Pump-N-Pantry 001 Property;**
99 Grow Avenue
Bridgewater Township, Susquehanna County, Pennsylvania
PADEP Facility ID#58-13092
USTIF Claim Numbers: #2015-0126(I) & #2017-0021(I)
LaBella Associates Project Number: 2171845 & 2171846

Dear Mr. Coar,

In response to the modifications suggested in the PADEP RAP approval letter dated April 18, 2019 (**Attachment A**) and an e-mail correspondence received from B&B Diversified Enterprises, Incorporated (USTIF's 3rd party reviewer) on May 1, 2019 (**Attachment B**), LaBella Associates, P.C. is pleased to provide this Remedial Action Plan Addendum. This RAP Addendum: (1) addresses modifications listed in the PADEP April 18, 2019 RAP approval letter (2) provides responses to comments received in the above-referenced e-mail correspondence, (3) summarizes revisions to the proposed SVE/AS system design, layout, and process equipment; and (4) includes an updated RAP project schedule. The RAP Addendum is summarized below.

PADEP April 18, 2019 RAP Approval Letter

- 1. LaBella should provide justification for using #00N silica sand with the 0.010-inch slot screen in SVE and AS points.*

Response: LaBella selected a readily available screen size that will reduce the potential for fines to enter the well and plug the well screen. A typical sand pack for this well size is #00; however, a slightly coarser sand pack (#00N) was selected based on the site geology and to increase porosity in the sand pack and thus increase the volume of air transferred into the formation.

- 2. Quarterly Remedial Action Progress Reports (RAPRs) should provide updated information regarding concentrations and quantities of contaminants of concern in air and water discharges.*

Response: LaBella will prepare and submit Quarterly RAPRs to the PADEP. The Quarterly RAPRs will include updated information regarding the concentrations and quantities of the contaminants of concern in the SVE influent and groundwater monitoring well network.

The SVE effluent will be treated with dual vapor phase activated carbon filters. PID readings will be collected at a point between the two (2) activated carbon filters at intervals equal to or less than $\frac{1}{4}$ the anticipated breakthrough time of the first carbon bed. Once breakthrough in the first carbon bed is observed, the 1st carbon bed will be replaced. The results of the PID monitoring will be included in the Quarterly RAPRs to the PADEP.

As discussed below, water generated during operation of the SVE/AS remediation system will be containerized in 55-gallon drums for off-site disposal. Alternatively, to minimize costs associated with off-site disposal of treated water, the water could be discharged via granulated activated carbon (GAC) into the municipal sanitary sewer system or closest stormwater sewer catch basin. Discharge to the sanitary sewer system would require approval from Bridgewater Township. Discharge to the stormwater sewer catch basin will require a NPDES permit. Another alternative would be to install a transfer pump with automatic level controls to pump the extracted water from the moisture separator to a small tank (~250 gallons) through GAC prior to discharge. The treated water would be re-injected into a trench or injection wells at the upgradient portion of the treatment zone. Quantities of water generated and disposal documents (as applicable) will be included in the Quarterly RAPRs to the PADEP. In the event water is discharged (under permit or otherwise) the analytical data associated with the system effluent sampling will be included in the Quarterly RAPRs to the PADEP.

3. *A Request for Determination of Changes of Minor Significance and Exemption from Plan Approval/Operating Permit under 25 PA Code §127.14 and 127.449 is to be submitted to the Department.*

Response: As indicated in the RAP, LaBella shall prepare and submit to PADEP a Request for Determination of Changes of Minor Significance and Exemption from Plan Approval / Operating Permit under 25 PA Code §127.14 and §127.449. The above-referenced permit will be submitted to PADEP prior to operation of the SVE/AS system.

4. *Purge water is to be address in accordance with the Technical Guidance Manual Appendix A Section D.3.e.*

Response: Purging will be conducted in accordance with the procedures detailed in Appendix A (Groundwater Guidance) Section D.3.e of the PADEP Technical Guidance Manual.

5. *Soil will be analyzed according to EPA Method 5035/8260B and groundwater samples will be analyzed according to EPA Method 5030B/8260B or 524.2.*

Response: Eight soil samples will be collected from each of two areas where Smear Zone contamination has been identified. The sixteen (16) soil samples will be submitted to a PADEP-certified laboratory for analysis of the Project Parameters using EPA Method 5035/8260B. The quarterly groundwater samples will be also be analyzed using EPA Methods 5030B/8260B.

6. *Quarterly RAPRs should provide analytical results for the full monitoring network unless the Department approves a reduction in monitoring points.*

Response: As indicated in the RAP, LaBella proposes to collect quarterly groundwater samples from monitoring wells MW-1 through MW-15 and observation wells OW-1 through OW-4. Groundwater analytical data will be reviewed periodically and LaBella will consult with PADEP to determine if any of the above-referenced sampling points can be removed from the monitoring well network.

7. *The Site Characterization Report (SCR) approved by DEP on March 15, 2018 addressed both open release incidents at this site (#48572 and #50143). Therefore, this RAP should address both open incidents at the site relative to soil and groundwater. Demonstration is required for both incidents.*

Response: Quarterly groundwater sampling will continue to evaluate groundwater quality at Incidents #48572 and 50143. Soil attainment samples will be collected at Areas #1 (defined by test borings TB-10 and TB-11 data) and #2 (defined by TB-7 data), which are located within Incident #48572. At Incident #50143, a total of 26.06 tons of contaminated soil was excavated in February 2017 as part of interim soil remediation activities. Analytical results for five (5) biased post-excavation soil samples collected from the resultant excavation demonstrated attainment of the Act 2 Statewide Health Standards for the site soils at Incident #50143.

Responses to May 1, 2019 B&B Diversified E-Mail Correspondence

SVE Treatment Point Layout

Comment: Vacuum influence was shown in the tables in Appendix W. The readings are shown to be in inches-H₂O down to 0.001 inches-H₂O. What gauges were used to measure this vacuum influence?

Response: Vacuum readings were measured in inches of water. A TSI VelociCalc Meter 9565 was used to measure vacuum influences.

Comment: Vacuum influence was inconsistent throughout the testing. If using a ROI design point of 0.1 in-H₂O, and given the inconsistency of the influence during testing, we suggest that the design SVE ROI be revised to approximately 12 feet for the SVE point spacing.

Response: LaBella concurs with reducing the ROI to twelve (12) feet. LaBella also concurs with using a horizontal system for the SVE portion of the remediation system, as outlined below.

SVE Treatment Point Design

Comment: We suggest that horizontal SVE laterals be used in order to enhance the SVE influence throughout the treatment area. Since groundwater is typically at 4 to 5 feet below surface grade (bsg), this would also be appropriate to minimize influent groundwater and would be a cost effective method of SVE application. We suggest that the horizontal SVE laterals be installed at depths of approximately 3 or 3.5 feet bsg to avoid drowning the SVE lateral screens. Also, an impermeable sheet barrier should be installed above the pea gravel and along the walls of the trench to minimize short circuiting of SVE air through the trench/surface and maximize the air that is drawn from the surrounding vadose zone soils. We understand that some combination of vertical SVE points and horizontal SVE laterals may be the best solution for the site given the large excavation and back-filled area within the treatment zone.

Response: LaBella concurs with the installation of a horizontal system. We suggest the system piping be installed at 3 ft. below grade within a pea gravel trench. The pea gravel could be limited to 6-inches around the piping on all sides followed by a geofabric above the pea gravel with native clean material placed on top of the geofabric then an impermeable sheet barrier can be installed on the top of the trench; however, we would not recommend installing an impermeable barrier along the walls of the trench as it will limit lateral air flow and promote upwelling of the water table towards the SVE extraction piping.

AS Treatment Point Layout

Comment: The pressure and DO influence was inconsistent throughout the testing. It is also difficult to determine a uniform pressure ROI when running SVE concurrent with the AS testing. In order to account for the inconsistency of the influence during testing, we suggest that the design AS ROI be revised to approximately 12 feet for the AS point spacing.

Response: LaBella concurs with reducing the design AS ROI to 12 feet.

AS Treatment Point Design

Comment: The proposed AS point construction is with screen from 8 to 9 ft bsg and sand pack up to 7 ft bsg. This only allows about 2 feet of submersion depth at the low water table. Typically, AS points are installed with the top of the screen a minimum of 5 feet below the low water table and preferably 8 to 10 feet below the low water table. Most unleaded gasoline contaminants remain in the top 10 feet of groundwater, so sparging so shallow will minimize the AS air ROI and maximize short circuiting to the unsaturated zone. Typically air is injected below the contaminated zone so that it rises up through it. We understand that bedrock is shallow at this site and that that is why this AS design was specified. Initial consolidated bedrock in the treatment zone monitoring wells range from approximately 5 feet below surface grade (bsg) in MW-1 to 10 feet bsg in MW-3. However, there are fractures and weathered zones present at varying depths ranging from 10 to 21 feet bsg in the monitoring wells in the treatment zone. We suggest that the AS screens are installed with longer screen intervals (4 to 8 feet) to intercept at least the first interval of weathered sandstone or fractures below the initial layer of consolidated bedrock. We suggest that each AS point be customized based on the encountered bedrock and fracture/weathered zone depths during drilling. We suggest that the AS screens be installed crossing the bedrock interface with about 1-foot of screen above the bedrock interface (if sufficiently below water) and several feet of screen below the bedrock interface to cross at least the first fractured/weathered zone below the highest consolidated bedrock layer. The additional screen would enhance AS flows and likely enhance lateral influence and treatment of the contaminated groundwater zone.

Response: LaBella concurs with this recommendation. The AS point installations will be varied based on the actual conditions encountered.

SVE Process Equipment

SVE Blower Specifications: Based on the results of the SVE/AS pilot test, the shallow water interval requires trenching between the air sparge points, the SVE portion of the remediation system is proposed to consist of horizontal piping set at approximately 3 feet below ground surface. The piping will be set in trenches filled with pea gravel. The pea gravel could be limited to 6-inches around the piping on all sides followed by a geofabric above the pea gravel with

native clean material placed on top of the geofabric then an impermeable material (i.e. poly sheeting) placed across the top of the trench prior to surface finishes to minimize short circuiting. Based on the area of groundwater impact (approximately 20,000 square feet) and the intent to capture off-gassing from the air sparge portion of the remediation system, a total air flow rate of 1,025 cubic feet/minute (CFM) is estimated operating at a vacuum of 5.21 inches of mercury. This is based on 4-inch diameter perforated piping being used for the extraction piping though a 6-inch diameter header piping should be utilized to reduce velocity and thus friction/pressure loss in the header piping. The horizontal SVE system is proposed to consist of four (4) “legs” with 4-inch perforated piping that are spaced approximately 20-25 feet apart. The soil vent blower will be sized to match these requirements.

Comment: Please clarify whether the SVE points and/or laterals would have individual lateral lines back to the equipment compound with individual valve control. We suggest individual SVE point control.

Response: A single header line will be used for each ‘leg’ of the horizontal SVE system. The SVE ‘legs’ will each be valved.

Comment: The RAP indicated that extracted groundwater will be placed in 55-gallon drums pending transportation and disposal. Should the volume of extracted groundwater exceed expected amounts, transportation and disposal may not be cost effective. Should this occur, we suggest consideration of the option of installing a transfer pump with automatic level controls to pump extracted water from the moisture separator through LGAC prior to discharge. The treated water could be re-injected into a trench or injection wells at the up-gradient portion of the treatment zone. Alternately, treated water could be discharged to the sanitary sewer (if available) or the closest storm sewer catch basin (under a NPDES permit).

Response: As an alternative to contract bidding, costs for installing a transfer pump with automatic level controls or alternatively, discharging treated groundwater to the sanitary sewer/storm water system will be considered in consultation with Bridgewater Township.

AS Process Equipment

Comment: Based on the pilot study, the pressures were 4.4 psi (IP-3) at 9.43 cfm and 3.0 psi at 5.39 cfm (IP-2). The inconsistent AS influence was enacted at these higher pressures/flows. We suggest selecting an AS blower that can provide at least 10 cfm per AS point at approximately 5 psi. We also suggest that the AS blower be capable of at least 10 psi pressure to account for any potentially tighter AS points in the final system. The AS flows will likely increase over time, and the greater pressure and flow will likely provide enhanced remedial effectiveness and minimize the timeframe of remediation.

Response: LaBella concurs with this recommendation. Based on the results of the SVE/AS pilot test, the AS portion of the remediation system is estimated to require up to 10 CFM/AS point with a radius of influence of 12 feet. Based on this ROI, it is estimated 36 to 46 points will be required to provide complete influence throughout the groundwater plume. The AS compressor will be sized based on the final number of AS points at 10 CFM/AS point. Bedrock at the site varies and has been encountered at depths ranging from 10 feet to 21 feet bgs. Groundwater at the site has been observed to fluctuate between 2.3 feet and 7.7 feet bgs. Based on these varying conditions, it is recommended that AS points vary based on location, but should include the following general requirements:

- AS points will be advanced to a minimum depth of 5 feet below the low water table and into the uppermost bedrock fracture zone; and
- AS point screens will vary based on the location and conditions encountered; however, LaBella recommends the AS screens be installed a minimum of 4 feet below the top of the low water table where bedrock is shallow.

Water Separator: A water separator will be used to remove water from the air stream extracted from the soil vent pump. No water was generated during the pilot test. Due to the relatively shallow depths to groundwater (~3-5 feet bgs), LaBella recommends that the system design include an option for installing a pump to a small tank (approximately 250 gallons) for water removed from the SVE system. In the event that significant water is encountered, it may be necessary to pump water through GAC and discharging to the municipal sewer system (Bridgewater Township). Discharging to the municipal sanitary sewer system will require approval of the township and a NPDES permit.

Comment: Please clarify whether the AS points will have individual lateral lines back to the equipment compound with individual valve control. We suggest individual AS point control.

Response: Each AS point will be valved to allow for control at each AS point.

Closing

LaBella understands that ICF/USTIF and B&B intend to bid out the implementation of the RAP. An updated project schedule is included in Attachment C.

I trust this information meets your needs. Please do not hesitate to contact me with any questions or comments concerning the contents of this letter or the project in general.

Sincerely,




Martin Gilgallon, P.G.
Regional Environmental Manager
LaBella Associates, P.C.

DC/KC/mg – 2171845

Attachments

cc: LaBella Associates Project File #2171845
Mr. Scott Quigg - Pump-n-Pantry, Inc. (email only)
Ms. Linda Melvin - ICF International (email only)
Mr. Timothy Pilcher, P.E. - B&B Diversified (email only)

ATTACHMENT A

PADEP RAP Approval Letter – April 18, 2019

April 18, 2019

Pump N Pantry
c/o Scott Quigg
754 Grow Ave.
Montrose, PA 18801-1439

Re: ECB-Storage Tanks Program
RAP Approval with Modifications Letter
Pump N Pantry 001
Facility ID #:58-13092
Incident#(s): #48572 & #50143
618 Crossley Rd.
Bridgewater Township, Susquehanna County

Dear Mr. Quigg:

The Department of Environmental Protection (DEP) has reviewed the February 25, 2019 document titled Remedial Action Plan for the release incident(s) referenced above. This document was prepared by LaBella Associates and submitted as a Remedial Action Plan (RAP) as required by 25 Pa. Code § 245.311. You selected the Non-residential Used Aquifer Statewide Health standard as the remediation standard for soil and groundwater.

DEP approves the RAP in accordance with Section 245.311(c)(2) with the following modifications:

1. LaBella should provide justification for using #00N silica sand with the 0.010-inch slot screen in SVE and AS points.
2. Quarterly Remedial Action Progress Reports (RAPRs) should provide updated information regarding concentrations and quantities of contaminants of concern in air and water discharges.
3. A Request for Determination of Changes of Minor Significance and Exemption from Plan Approval/Operating Permit under 25 PA Code §127.14 and 127.449 is to be submitted to the Department.
4. Purge water is to be addressed in accordance with the Technical Guidance Manual Appendix A Section D.3.e.
5. Soil will be analyzed according to EPA Method 5035/8260B and groundwater samples will be analyzed according to EPA Method 5030B/8260B or 524.2.
6. Quarterly RAPRs should provide analytical results for the full monitoring network unless the Department approves a reduction in monitoring points.
7. The Site Characterization Report (SCR) approved by DEP on March 15, 2018 addressed both open release incidents at this site (#48572 and #50143). Therefore, this RAP should

address both open incidents at the site relative to soil and groundwater. Demonstration of attainment is required for both incidents.

25 Pa. Code § 245.312(a) requires that remedial action shall be implemented upon approval of the RAP. Remedial action should, therefore, commence immediately upon receipt of this letter and proceed in accordance with the schedule contained in Table 7-1 in the RAP until the selected remediation standard is attained.

RAPRs must be submitted to DEP in accordance with Section 245.312(b-d) by the 30th day of the month following the end of each quarter (April 30, July 30, October 30 and January 30). The final RAPR is to be submitted as part of the Remedial Action Completion Report. Your first RAPR is due no later than July 30, 2019 and should address the modifications noted above.

Please ensure that your RAPRs are submitted timely and address the elements described within Section 245.312(c), specifically including a discussion of the progress to date toward attainment of the selected remediation standard(s). A copy of Section 245.312 is enclosed for your reference.

Failure to implement remedial action or submit complete progress reports in accordance with the schedule outlined above may result in enforcement action by DEP. If you wish to modify any part of this Remedial Action Plan or select a new remediation standard, you must prepare and submit a new or modified Remedial Action Plan to DEP in accordance with Section 245.312(e).

Any person aggrieved by this action may appeal the action to the Environmental Hearing Board (Board) pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. § 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A. The Board's address is:

Environmental Hearing Board
Rachel Carson State Office Building, Second Floor
400 Market Street
P.O. Box 8457
Harrisburg, PA 17105-8457

TDD users may contact the Environmental Hearing Board through the Pennsylvania Relay Service, 800-654-5984.

Appeals must be filed with the Board within 30 days of receipt of notice of this action unless the appropriate statute provides a different time. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

A Notice of Appeal form and the Board's rules of practice and procedure may be obtained online at <http://ehb.courtapps.com> or by contacting the Secretary to the Board at 717-787-3483. The Notice of Appeal form and the Board's rules are also available in braille and on audiotape from the Secretary to the Board.

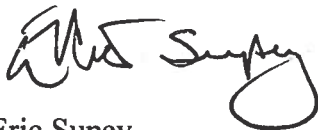
April 18, 2019

IMPORTANT LEGAL RIGHTS ARE AT STAKE. YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD AT 717-787-3483 FOR MORE INFORMATION. YOU DO NOT NEED A LAWYER TO FILE A NOTICE OF APPEAL WITH THE BOARD.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST BE FILED WITH AND RECEIVED BY THE BOARD WITHIN 30 DAYS OF RECEIPT OF NOTICE OF THIS ACTION.

The technical review of this document was conducted under the responsible charge of a Pennsylvania Licensed Professional Geologist. If you have any questions or desire clarification regarding the above, then please contact Edie Gair Shull, Licensed Professional Geologist, who can be reached either by telephone at (570)830-3028 or through e-mail at egairshull@pa.gov.

Sincerely,



Eric Supey
Environmental Program Manager
Environmental Cleanup & Brownfields Program

Enclosure: Chapter 245.312

cc: Bridgewater Township, Susquehanna County
LaBella Associates, Martin Gilgallon
USTIF

§ 245.312. Remedial action.

(a) Upon reasonable notice by the Department to the responsible party, or upon approval of the remedial action plan by the Department, the responsible party shall implement the remedial action plan, or a portion of the remedial action plan, according to the schedule contained therein.

(b) During implementation of the remedial action plan, remedial action progress reports shall be submitted to the Department quarterly or at an alternative interval as determined by the Department.

(c) Each remedial action progress report shall provide the data generated during the reporting period and shall show the progress to date toward attainment of the selected remediation standard. Each report shall be complete and concisely organized and shall contain the following elements, as necessary, based on the nature, extent, type, volume or complexity of the release:

- (1) A summary of site operations and remedial progress made during the reporting period.
- (2) Data collected from monitoring and recovery wells showing depth to groundwater and thickness and horizontal extent of free product.
- (3) Groundwater contour maps depicting groundwater flow direction.
- (4) Quantitative analytical results from groundwater, surface water, soil and sediment sampling.
- (5) Maps for all media and all phases at specified times that indicate the distribution of concentrations of regulated substances.
- (6) For fate and transport analyses, the following information, in addition to that required by § 250.204(f)(5) (relating to final report):
 - (i) An isoconcentration map showing the configuration and concentrations of contaminants within the plume being analyzed.
 - (ii) Sufficient information from monitoring data to establish whether the plume is stable, shrinking or expanding.
 - (iii) Input parameters for the analysis and the rationale for their selection.
 - (iv) Figures showing the orientation of the model or analysis to the field data.
 - (v) Comparison and analysis of the model or mathematical output to the actual field data.
- (7) Reporting period and cumulative amounts of free product recovered, groundwater treated, and soil and sediment treated or disposed.
- (8) Treatment and disposal documentation for waste generated during the reporting period.
- (9) Demonstration that required Federal, State and local permits and approvals are being complied with.
- (10) A report of additional items necessary to describe the progress of the remedial action.

ATTACHMENT B

B&B Diversified Incorporated E-Mail Correspondence - May 1, 2019

Coleman, Donald

From: Tim Pilcher <tpilcher@bbde.com>
Sent: Wednesday, May 1, 2019 12:48 PM
To: Coleman, Donald; Gilgallon, Martin
Cc: Linda Melvin; B&B Diversified (Mark)
Subject: Pump-n-Pantry (Montrose) - Claim Nos. 2015-0126(I) & 2017-0021(I)

Dear Don and Marty:

ICF/USTIF plans to bid out the remediation and closure activities portion of this project. With that said, we are requesting that a RAP Addendum be prepared based on our comments below. Please confirm with Mr. Quigg that he approves of LaBella preparing and submitting a RAP Addendum.

We have reviewed the Pump-n-Pantry Site Characterization Report (1/9/18), Revised Feasible Remedial Alternatives Analysis Report (8/31/18), Pilot Test Work Plan and Cost Summary (10/15/18), Remedial Action Plan (2/25/19), and PADEP's RAP approval letter (4/18/19) and have the following comments and questions:

SVE Treatment Point Layout

It was mentioned a number of times in the pilot study discussion section that notable influences were recorded in monitoring points during SVE testing. Please clarify the level of vacuum that was used for the SVE system design and radius of influence (ROI) of 15 feet. A typical design point is 0.1 inches-H₂O vacuum for ROI. Vacuum influence was shown in the tables in Appendix W. The readings are shown to be in inches-H₂O down to 0.001 inches-H₂O. What gauges were used to measure this vacuum influence? Please confirm that these vacuum influence measurements were in inches-H₂O and not feet-H₂O or inches-Hg. Provided below is a summary of the vacuum influences shown on the tables:

SVE-1 Vacuum Test (7 in-Hg & 50 scfm):

SVE-2: 0.022 in-H₂O at 13.8 ft distance

MW-15: 0.007 in-H₂O at 18 ft distance

All other monitored points showed positive pressure at distances from 10.9 ft to 161 ft.

SVE-2 Vacuum Test (7 in-Hg & 50 scfm):

SVE-1: 0.008 in-H₂O at 13.8 ft distance

IP-3: 0.176 in-H₂O at 12 ft distance

MW-15: 2.955 in-H₂O at 6 ft distance

All other monitored points showed positive pressure at distances from 18.8 ft to 146 ft.

SVE-3 Vacuum Test (6.38 in-Hg & 70 scfm):

IP-3: 0.079 in-H₂O at 10 ft distance

MP-2: 0.079 in-H₂O at 15 ft distance

MW-2: 0.084 in-H₂O at 10.2 ft distance

MW-3: 0.054 in-H₂O at 77 ft distance

MW-15: 0.007 in-H₂O at 22 ft distance

All other monitored points showed either 0 vacuum influence or positive pressure at distances from 10 ft to 155 ft.

In summary, the vacuum influence was inconsistent throughout the testing. If using a ROI design point of 0.1 in-H₂O, and given the inconsistency of the influence during testing, we suggest that the design SVE ROI be revised to approximately 12 feet for the SVE point spacing.

SVE Treatment Point Design

We suggest that horizontal SVE laterals be used in order to enhance the SVE influence throughout the treatment area. Since groundwater is typically at 4 to 5 feet below surface grade (bsg), this would also be appropriate to minimize influent groundwater and would be a cost effective method of SVE application. We suggest that the horizontal SVE laterals be installed at depths of approximately 3 or 3.5 feet bsg to avoid drowning the SVE lateral screens. Also, an impermeable sheet barrier should be installed above the pea gravel and along the walls of the trench to minimize short circuiting of SVE air through the trench/surface and maximize the air that is drawn from the surrounding vadose zone soils. We understand that some combination of vertical SVE points and horizontal SVE laterals may be the best solution for the site given the large excavation and back-filled area within the treatment zone.

AS Treatment Point Layout

How was the ROI determined for the air sparge (AS) system? Typically an AS test is run without SVE operations to determine the AS influence alone and then a combined AS/SVE test is run to insure capture and increased vapor concentrations. Please clarify the level of pressure that was considered to be noticeable and the pressure level that was used for the AS system design and ROI. A typical design point is 0.1 inches H₂O pressure for ROI. Provided below is a summary of the AS pressure influences above 0.05 in-H₂O:

IP-3 Pressure Test (4.4 psi & 9.43 cfm):

SVE-2: 6.470 in-H₂O at 9.0 ft distance

IP-2: 0.053 in-H₂O at 12.0 ft distance

All other monitored points showed either negative pressure (vacuum) influence or influence <0.05 in-H₂O at distances from 14.2 ft to 154 ft.

IP-2 & IP-3 Combined Pressure Test (IP-2: 3 psi & 5.39 cfm, IP-3: 3.2 psi & 7.88 cfm):

MP-1: 7.003 in-H₂O at 10.0 ft distance

MP-3: 0.189 in-H₂O at 25 ft distance

All other monitored points showed either negative pressure (vacuum) influence or influence <0.05 in-H₂O at distances from 12 ft to 154 ft.

Post AS/SVE monitoring data showed that Dissolved Oxygen (DO) increased significantly in SVE-3, which is 10 feet from both AS test points IP-2 and IP-3. However, the majority of the other monitoring points showed little or no increase in DO.

In summary, the pressure and DO influence was inconsistent throughout the testing. It is also difficult to determine a uniform pressure ROI when running SVE concurrent with the AS testing. In order to account for the inconsistency of the influence during testing, we suggest that the design AS ROI be revised to approximately 12 feet for the AS point spacing.

AS Treatment Point Design

The proposed AS point construction is with screen from 8 to 9 ft bsg and sand pack up to 7 ft bsg. This only allows about 2 feet of submersion depth at the low water table. Typically, AS points are installed with the top of the screen a minimum of 5 feet below the low water table and preferably 8 to 10 feet below the low water table. Most unleaded gasoline contaminants remain in the top 10 feet of groundwater, so sparging so shallow will minimize the AS air ROI and maximize short circuiting to the unsaturated zone. Typically air is injected below the contaminated zone so that it rises up through it. We understand that bedrock is shallow at this site and that that is why this AS design was specified. Initial consolidated bedrock in the treatment zone monitoring wells

range from approximately 5 feet below surface grade (bsg) in MW-1 to 10 feet bsg in MW-3. However, there are fractures and weathered zones present at varying depths ranging from 10 to 21 feet bsg in the monitoring wells in the treatment zone. We suggest that the AS screens are installed with longer screen intervals (4 to 8 feet) to intercept at least the first interval of weathered sandstone or fractures below the initial layer of consolidated bedrock. We suggest that each AS point be customized based on the encountered bedrock and fracture/weathered zone depths during drilling. We suggest that the AS screens be installed crossing the bedrock interface with about 1-foot of screen above the bedrock interface (if sufficiently below water) and several feet of screen below the bedrock interface to cross at least the first fractured/weathered zone below the highest consolidated bedrock layer. The additional screen would enhance AS flows and likely enhance lateral influence and treatment of the contaminated groundwater zone.

SVE Process Equipment

Given the above discussion points, the SVE blower specifications may be revised.

Please clarify whether the SVE points and/or laterals would have individual lateral lines back to the equipment compound with individual valve control. We suggest individual SVE point control.

The RAP indicated that extracted groundwater will be placed in 55-gallon drums pending transportation and disposal. Should the volume of extracted groundwater exceed expected amounts, transportation and disposal may not be cost effective. Should this occur, we suggest consideration of the option of installing a transfer pump with automatic level controls to pump extracted water from the moisture separator through LGAC prior to discharge. The treated water could be re-injected into a trench or injection wells at the up-gradient portion of the treatment zone. Alternately, treated water could be discharged to the sanitary sewer (if available) or the closest storm sewer catch basin (under a NPDES permit).

AS Process Equipment

Given the above discussion points, the AS blower/compressor specifications may be revised. However, the RAP proposes an operating pressure of 2.5 psi and flow of 4 cfm per AS point. Based on the pilot study, the pressures were 4.4 psi (IP-3) at 9.43 cfm and 3.0 psi at 5.39 cfm (IP-2). The inconsistent AS influence was enacted at these higher pressures/flows. We suggest selecting an AS blower that can provide at least 10 cfm per AS point at approximately 5 psi. We also suggest that the AS blower be capable of at least 10 psi pressure to account for any potentially tighter AS points in the final system. The AS flows will likely increase over time, and the greater pressure and flow will likely provide enhanced remedial effectiveness and minimize the timeframe of remediation.

Please clarify whether the AS points will have individual lateral lines back to the equipment compound with individual valve control. We suggest individual AS point control.

RAP Revisions

Based on the above comments, ICF/USTIF and B&B request that LaBella prepare and submit a RAP Addendum for submittal to PADEP. We suggest that the RAP Addendum be in a letter format and simply document any system design and RAP item changes. The revisions that would be documented in the RAP Addendum would be as follows:

- Summarize any revisions to the AS/SVE system design that are agreed upon.
- ICF/USTIF plans to bid-out the implementation of the final approved RAP for the Site, so we request that the RAP implementation schedule be revised in the RAP Addendum to account for the bidding out

process. See below for an anticipated schedule for bidding out the project and initial RAP implementation. LaBella would have to add to the schedule to include the active remediation and closure activities.

- Acknowledge/address the modifications listed in the PADEP RAP approval letter dated April 18, 2019.

ICF has discussed the potential RAP revisions/addendum with PADEP, and has indicated that a RAP Addendum would be submitted on or before May 15, 2019. Please let us know if this schedule is reasonable and acceptable.

RAP Bid Out Schedule

May 15, 2019 - Submittal of the RAP Addendum to the PADEP

July 1, 2019 - PADEP approves the RAP Addendum

July 1, 2019 - RFB is posted to website

July 15, 2019 - Mandatory Site Walk

August 1, 2019 - RFB due date

August 20, 2019 - Bid review meeting

September 1, 2019 - Claimant selects winning bidder

September 23, 2019 - Contract signed

November 30, 2019 - System install starts

Please don't hesitate to call or email with any questions regarding the comments/questions above. We look forward to your response.

Thanks,
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ATTACHMENT C

Project Schedule

Project Schedule
Proposed Soil & Groundwater Remediation Project Schedule
Pump-N-Pantry #001 Property

Task #	Description	Timeframe
	Submit RAP Addendum	May 20, 2019
	PADEP Approves RAP Addendum	July 1, 2019
	Request for Bid (RFB) Posted to USTIF Website	July 1, 2019
	Mandatory Site Walk	July 15, 2019
	RFB Due	August 1, 2019
	Bid Review Meeting	August 20, 2019
	Contract Award	September 1, 2019
	Contract Signed	October 1, 2019
1.0	Project Planning / Project Management	
1.1	Scope of Work & Project Guidance Documents	November 1, 2019
1.2	Project Management	Ongoing
2.0	Baseline Groundwater Monitoring Activities	December 1, 2019
3.0	Permits	December 1, 2019
4.0	Installation of Full Scale System	January 2020
	Initiate SVE/AS System Operation	February 2020
5.0	Quarterly Groundwater Monitoring Activities	
5.1	Round 1 – Remediation	May 2020
5.2	Round 2 – Remediation	August 2020
5.2	Round 3 – Remediation	November 2020
5.4	Round 4 – Remediation	February 2021
5.5	Round 5 – Attainment	May 2021
5.6	Round 6 – Attainment	August 2021
5.7	Round 7 – Attainment	November 2021
5.8	Round 8 – Attainment	February 2022
5.9	Round 9 – Attainment	May 2022
5.10	Round 10 – Attainment	August 2022
5.11	Round 11 – Attainment	November 2022
5.12	Round 12 – Attainment	February 2023
6.0	Waste Material Handling – Disposal of Soil Cuttings	As Necessary
	Waste Material Handling – Disposal of Spent Carbon	As Necessary
	Waste Material Handling – Disposal of System Water	As Necessary
7.0	Demonstration of Soil Attainment	May 2023
8.0	Preparation of the RACR	July 2023
9.0	Site Closure	TBD