# EXCAVATION OF CLEAN OVERBURDEN AND PETROLEUM CONTAMINATED SOILS

AN OHIO DEPARTMENT OF DEVELOPMENT -BROWNFIELD REMEDIATION PROGRAM FUNDED PROJECT



ADMINISTERED BY:

STARK COUNTY LAND REUTILIZATION CORPORATION

BID OPENING:

JUNE 11, 2025 11:00 AM EST

#### **NOTICE TO BIDDERS**

#### STARK COUNTY LAND REUTILIZATION CORPORATION (LAND BANK)

## 5/27/2025

**NOTICE IS HEREBY GIVEN** that the Stark County Land Reutilization Corporation (the "Land Bank"), organized and existing under Chapter 1724 of the Revised Code of the State of Ohio, will receive Sealed Bids for:

# EXCAVATION OF CLEAN OVERBURDEN AND PETROLEUM CONTAMINATED SOILS at the FORMER COLUMBUS RD STARFIRE GAS STATION 2433 COLUMBUS RD NE, CANTON, OHIO 44705

This Contract is for all labor, material, insurance, and equipment necessary for the excavation, hauling and disposal of petroleum contaminated soils (PCS) and backfilling of excavation; mixing of groundwater remediation materials to exposed groundwater within exposed excavated cavity prior to backfilling activities at the former Columbus Rd NE Starfire Gas Station, in accordance with approved plans and specifications.

Bid documents may be downloaded from the Land Bank's website at <u>https://www.starkcountylandbank.org</u>. Bid responses will be received at the Land Bank's office, 201 3<sup>rd</sup> St. NE, Suite 201, Canton, OH 44702, until 4:00 PM Tuesday, June 10<sup>th</sup>, 2025.

PANDEY Environmental, LLC (PANDEY) is providing oversight for the project on behalf of the Land Bank. All questions regarding this project should be directed to Jason Martin, Project Manager for PANDEY at 614-444-8078 ex. 203 or at <u>imartin@pandeyenvironmental.com</u> or the Land Bank Manager, Sarah Peters, or at <u>smpeters@starkcountyohio.gov</u> by 3:00 PM Monday, June 9<sup>th</sup>, 2025.

The bid shall be legibly prepared and submitted in an organized manner. The bid shall be submitted under company cover letter, legally signed, and the complete address, phone numbers and email addresses of the Bidder given thereon. Bid shall be accompanied by a certified check, cashier's check, or letter of credit in favor of the Land Bank in amount equal to 10 percent (10%) of the total bid amount, or an acceptable Bid Bond with satisfactory surety in the full amount of Bid, specifying the Land Bank as the obligee.

Any bid may be withdrawn prior to the scheduled closing time for receipt of bids.

The Land Bank intends and requires that the project be completed no later than sixty (60) calendar days from the date of the Notice to Proceed.

Bidders must comply with the Prevailing Wage Rates on Public Improvements in Stark County, Ohio, as determined by the Ohio Department of Commerce, Bureau of Wage and Hour Administration.

The Land Bank reserves the right to reject in whole or in part any or all bids, to waive any technicalities, to advertise for new bids, to accept any proposal or combination of proposals which is deemed most favorable to the Land Bank at the time and under the conditions stipulated, or to proceed with the work when the best interests of the Land Bank will be promoted thereby.

This Notice is available on the Land Bank's internet website at <u>https://www.starkcountylandbank.org</u> and by clicking on the bid link on the website's home page and you will be able to view this notice in PDF format.

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#### **INSTRUCTIONS TO BIDDERS**

#### SOIL EXCAVATION of the FORMER COLUMBUS RD STARFIRE GAS STATION

## 1. **DESCRIPTION**

The contract is for all labor, material, insurance, bonds, and equipment necessary for the soil excavation at the former Columbus Rd NE Starfire Gas Station property, in accordance with the approved plans and specifications.

#### 2. **INSPECTION OF SITE**

Each bidder is encouraged to visit the site of the proposed work and shall fully acquaint themselves with the existing conditions there relating to the project work. Jason Martin, Project Manager for PANDEY Environmental, LLC who is providing oversight of this project, can be reached at 614-444-8078 ex. 203 or at <u>imartin@pandeyenvironmental.com</u> to schedule a site visit. The bidder shall thoroughly examine and familiarize themselves with the Technical Specifications and all other contents of the Bid Package. The contractor, by the execution of the contract, shall, in no way, be relieved of any obligation by his failure to familiarize themselves with the Bid Package or the Contractor's failure to visit the site and acquaint themselves with the conditions there existing and the Stark County Land Reutilization Corporation, will be justified in rejecting any claim based on facts regarding which he should have been on notice as a result thereof.

#### 3. TIME AND PLACE FOR RECEIPT OF BIDS

Bids will be received by the Stark County Land Reutilization Corporation ("Land Bank") at its office at 201 3rd St. NE, Suite 201, Canton, OH 44702, until 4:00 PM EST on Tuesday, June 10<sup>th</sup>, 2025.

#### 4. FORM OF BIDS

All Bids must be submitted on forms supplied by the Land Bank, and shall be subject to all requirements of the Specifications. All bids must be regular in every respect. The Land Bank may consider as irregular any Bid Sheet on which there is an alteration for or departure from the original Bid Sheet and at its option may reject the same. This requirement shall not operate to bar the bidder from filing with his proposal a separate statement of any desired effect, which statement will be considered by the Land Bank, on its merits.

Bids shall be plainly marked, identifying the Bid, the Bidder, the Bidder's business address, and the date submitted, as follows:

#### Soil Excavation of the Former Columbus Rd NE Starfire Gas Station

Submitted by:

If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified in the bid form.

If the contract is awarded, it will be awarded by the Land Bank to a responsible bidder on the basis of the lowest bid for all work and materials, as listed in the Bid Sheet and being the most favorable to the Land Bank. The contract will require the completion of work in accordance with the Specifications.

#### 5. CERTIFIED CHECK/BID BOND

Each Bidder shall be accompanied by a certified check, cashier's check, or letter of credit in favor of the Land Bank in the amount of ten percent (10%) of the total bid amount or bid bond in the full amount of the bid, specifying the Land Bank as the Obligee. Certified checks or bid bonds will be returned to all Bidders within ten (10) days after entering into the contract.

## 6. CONTRACT BOND

The successful Bidder, at its own expense, will be required to furnish, at the time of the execution of the contract, a performance bond in an amount equal to one hundred percent (100%) of the amount of the contract awarded. The completed performance bond will not be released until all of the provisions of the contract have been fulfilled.

#### 7. TIME FOR PERFORMANCE

All work shall be completed within sixty (60) calendar days from the date of Notice to Proceed.

## 8. NON-COLLUSION AFFIDAVIT

Each bidder submitting a bid to the Land Bank shall execute a Non- Collusion Affidavit.

#### 9. WITHDRAWAL OF BIDS

Any Bid may be withdrawn prior to the scheduled closing time for the receipt of Bids. All Bids are to remain effective for a minimum of sixty (60) days following closing time. The withdrawal of a Bid after the scheduled closing time for receipt of Bids shall result in the forfeiture of the bid bond or certified check submitted with the Bid.

#### 10. **RIGHT TO ACCEPT AND REJECT BIDS**

The Land Bank reserves the right to reject in whole or in part any or all bids, to waive any technicalities, to advertise for new bids, to accept any proposal or combination of proposals which is deemed most favorable to the Land Bank at the time and under the conditions stipulated, or to proceed with the work when the best interests of the Land Bank will be promoted thereby.

#### 11. LATE BIDS

No bids, regardless of the circumstances, will be accepted if submitted after the advertised opening. Such bids will be returned unopened to the bidder.

#### 12. BID OPENING

Bids shall be opened on Wednesday, June 11<sup>th</sup>, 2025 at 11:00 AM EST. Usually, immediately after all bids are opened and read, the Land Bank will refer them to the Environmental Consultant overseeing the project for detailed tabulation, evaluation and recommendation...after which the award will be made.

#### 13. NONDISCRIMINATION

The Land Bank, in accordance with Title VI of the Civil Rights Act of 1964, hereby notifies all bidders that it will affirmatively ensure that Minority Business Enterprises and Women-Owned Businesses will be afforded full opportunity to submit to this invitation and will not be discriminated against on the grounds of race, color, religion, sex, national origin, disability or age in consideration for an award.

#### 14. **PREVAILING WAGE RATES**

The bidder acknowledges and agrees that all wages paid to laborers and mechanics employed in connection with the performance of this Work will be paid at not less than the prevailing rates of wages for laborers and mechanics for each class of work called for, in accordance with the requirements of Chapter 4115 of the Ohio Revised Code.

#### 15. OHIO SALES TAX

The Land Bank is exempt from the payment of the Ohio Sales and Use Tax. Consequently, the cost of such is not to be included in the proposal.

#### 16. EQUAL EMPLOYMENT OPPORTUNITY

Attention of bidders is particularly called to the requirement ensuring that employees and applicants for employment are not discriminated against because of their race, color, creed, national origin, or sex. Bidder must submit a signed "Contractor Equal Employment Opportunity Certification".

#### 17. **INSURANCE REQUIREMENTS**

The selected contractor agrees to maintain statutory worker's compensation coverage as required by law, and comprehensive general insurance coverage of \$2 million per occurrence. If comprehensive general and/or automotive liability coverage amounts are insufficient, the insufficiency can be made sufficient by umbrella liability coverage in the amount of or greater than the insufficiency. Subcontractor agrees to provide current Worker's Compensation and Liability Insurance verification with this signed contract.

In addition to the above insurance requirements, the selected Contractor agrees to maintain Pollution Liability coverage of \$1 million per occurrence, Stop Gap Liability insurance coverage of \$1 million per occurrence, and Automotive Liability Insurance coverage of \$1 million per occurrence. If automotive liability coverage amounts are insufficient, the insufficiency can be made sufficient by umbrella liability coverage in the amount of or greater than the insufficiency.

Contractor agrees to add the Stark County Land Reutilization Corporation (SCLRC), 201 3rd Street NE, Suite 201, Canton, Ohio 44702 and PANDEY Environmental, LLC, 6277 Riverside Drive, Dublin, OH 43017 as a "Certificate Holder." A copy of the "Certificate of Liability Insurance" reflecting the required coverage's, and verifying SCLRC and PANDEY Environmental, LLC as a "Certificate Holder" is required.

The SCLRC and PANDEY Environmental, LLC must also be named as an "Additional Insured" on the General Liability, Auto and Pollution coverage's. A copy of the Additional Insured endorsement CG2010(10/01) or CG2037(10/01) a blanket endorsement or their equivalent must be attached to the Certificate. In addition, the "Cancellation Section" of the Certificate must be amended to read as follows: "Should any of the above described policies be cancelled before the expiration date thereof, the issuing insurer will mail a 30 days written notice to the certificate holder named to the left."

#### 18. CONTRACT AWARD

Submitted Bids should be valid for a period of sixty (60) days. The contract will be awarded to the lowest responsible and responsive bidder meeting the requirements. A Notice to Proceed will be issued to the successful bidder following approval by the Board of Directors of the Land Bank.

#### 19. **PERMITS & FEES**

The Contractor shall obtain and pay for all permits, fees and licenses necessary for the performance of his work on the project, and the cost of such may be included in the proposal.

## 20. SUBCONTRACTORS

Subcontractors at any tier are required to comply with the Land Bank's Insurance Specifications which, unless stated differently, are the same as those required of Prime Contractors.

#### 21. LIQUIDATED DAMAGES

The Land Bank will suffer additional costs if the project is not substantially completed within the time specified. As a condition to the acceptance of the Contract, each contractor and its surety shall be liable for and pay the Land Bank liquidated damages in the amount of \$500.00 for each day the Project remains in an unfinished condition beyond the Time for Completion set forth in these Instructions to Bidders. Such amount may be deducted by the Land Bank from any payment due or to become due to said Contractor. Nothing under this section shall prohibit the Land Bank from recovery of damages for delay under other provisions of the Contract documents.

Punch list items must be completed within 30 days after a substantial completion acceptance, signified by a written inspection report by the SCLRC's representative, to avoid imposing liquidated damaged penalties.

The said amount is fixed because of the impracticability and extreme difficulty of determining and fixing the actual additional costs the Land Bank would in such event sustain, and said amount is agreed to be the amount of damages which the Land Bank would sustain and shall not be treated as retainage.

Time is of the essence for each and every portion of the Project and of the Specifications wherein a definite and certain length of time is fixed for the performance of any act. Where an additional time is allowed for the completion of any Work, the new time fixed by such extension shall control. The Contractor shall not be charged with liquidated damages when the Land Bank determines the Contractor is without fault and the Contractor's reasons for the time extension are acceptable to the Land Bank, providing the Contractor shall, within ten (10) days from the beginning of such delay, notify the Land Bank, in writing, of the causes of delay.

All such extensions of time shall be by fully executed Change Orders.

#### FORMAT FOR BIDS

It is the contractor's responsibility to inform themselves of the conditions relating to this project and review the

attached SCOPE OF WORK and SPECIFICATIONS.

Please use the following general format for submission of bid.

- 1. Estimated Project Duration in days
- 2. Mobilization Fee(s)
- 3. Demobilization Fee(s)
- 4. Equipment / Operator Costs per day rate and estimated full project duration total (for each type of equipment: i.e. excavator, skid steer, equipment operator)
- 5. Itemized miscellaneous costs (i.e. perimeter fencing, stormwater runoff controls, utility locating services, gravel cover, etc.)
- 6. Transportation and Disposal Costs of Petroleum Contaminated Soils per ton rate
- 7. Backfill Material costs (transported, placed, and compacted) per cubic yard

#### **BID SHALL CONTAIN**

- A signed proposal, with the full name and title (if appropriate) of the person submitting the bid.
  If the signature is not legible, print the name under the signature of the person signing the proposal.
- A Bid Guaranty Bond (If issued by a surety company, they must be authorized to do business in Ohio.)
- In the case of corporations not chartered in Ohio, a proper certificate of the Secretary of State,

certifying that such corporation is authorized to do business in Ohio.

- Non-Collusion Affidavit (p. 12)
- Bidders Profile Form (pgs. 16-20)
- Tax Liability Form (p. 13 or p.14)
- Signed Contractor Equal Employment Opportunity Certification (p.15)
- Other items as specified by the Environmental Consultant, Engineer or specification writer.

## **BID SHEET**

Section 1	Project Duratio	n
Projected Project Duration (in days)		
Section 2	Price	
Item 1: Mobilization Fee(s)	\$	
Item 2: Demobilization Fee(s)	\$	
Item 3: Equipment/Operator Costs per day rate and	Per day Rate	Total
estimated full project duration total (for each type of equipment: i.e. excavator, skid steer, equipment operator)	\$	\$
Item 4: Itemized Miscellaneous Costs	\$	
(i.e. perimeter fencing, stormwater runoff controls, utility	\$	
	\$	
	\$	
Item 5: Transportation and Disposal Costs of Petroleum	Per ton Rate	Total
Contaminated Soils per ton rate	\$	\$
Item 6: Backfill Materials Cost(s) (transported, placed, and	Per cubic Yard	Total
compacted) per cubic yard	\$	\$
Total Bid	\$	

Submitted By:	
Signature:	Title:
Date:	_
Company Name:	
Contractor Address:	
Contractor Phone:	
Email Address:	

\_\_\_\_

\_

## LIST OF SUBCONTRACTORS

In the spaces below, the BIDDER shall list the names and addresses of any subcontractors to which the BIDDER proposes to sublet any portion of the work to be done under this CONTRACT. The BIDDER shall also state that portion of the work by Item No. and Description sublet to each contractor.

Item No.	Description	Name of Subcontractor	Subcontractor's Address

#### PREVAILING WAGE REQUIREMENT

## State of Ohio Pre-determined Wage Rate Requirements

Upon successful award of contract by the Stark County Land Reutilization Corporation ("Land Bank"), the contractor shall provide the prevailing wage coordinator, Malia Burgasser, with a schedule of dates when payments to employees are to be made.

On a weekly basis, the contractor shall submit a certified copy of his complete payroll for each date exhibiting for each employee paid any wages, their name, current address, social security number, number of hours worked each day during the pay period and the total for each week, their hourly rate of pay, job classification, fringe payments, and deductions from their wages.

Weekly Certified Payroll Reports shall be submitted to:

Stark County Land Reutilization Corporation Attn: Malia Burgasser, Prevailing Wage Coordinator 201 Third Street, NE, Suite 201 Canton, OH 44702

Such reports shall be submitted to the prevailing wage coordinator not less than three weeks after each pay date which shall exhibit the aforementioned wage information. The certification of each payroll shall be executed by the contractor and shall recite that the payroll is correct and complete and that the wage rates shown are not less than those required by the contract.

#### NON-COLLUSSION AFFIDAVIT

STATE OF	)	
	) (	SS.
COUNTY OF	)	

Affiant

Subscribed and sworn to before me this \_\_\_\_\_day of \_\_\_\_\_, 20\_\_\_\_,

Notary Public, State of Ohio

My Commission Expires:\_\_\_\_

#### STATEMENT OF NON-LIABILITY

#### FOR DELIQUENT PERSONAL PROPERTY TAXES \*

STATE OF OHIO	) ) \$\$:			
STARK COUNTY	)			
(see note below	, being fir	rst duly	sworn, says that he/she may be	awarded
a contract by	(name of taxing district)		after competitive bidding, and t	that at the
time of submission of s	aid bid said affiant was not	t charge	d with any delinquent personal	property tax
on the general tax list o	of personal property of Star	rk Coun	ty.	
	-			
			(see note below)	
Sworn to and subscribe	ed before me this	_ day of	F	_, 20

Notary Public

NOTE: Where an individual has submitted a bid, the name of the individual should appear here. Where an individual signs for a partnership the name of the partner signing for the partnership should appear together with the name of the partnership. Where corporation has submitted a bid, the name of the officer, his position and the name of the corporation should appear.

\* Complete either liability or non-liability form but not both.

(This page may be photocopied, but not retyped)

#### STATEMENT OF LIABILITY FOR DELINQUENT

#### PERSONAL PROPERTY TAXES \*

STATE OF OHIO	)	
STARK COUNTY	)SS: )	
	, being first duly sworn, says t	that he may be
(see note below)		
awarded a contract by	after compe	titive bidding,
	(name of subdivision)	
and that at the time of the submission	on of said bid affiant was charged with delinquent per	sonal property
taxes on the general tax list of perso	onal property of Stark County, Ohio and that the amou	int of such due
and unpaid delinquent taxes is \$		
and that the amount of the due and	unpaid penalties and interest is \$	
	(see note below)	
Sworn to and subscribed before me	thisday of	, 20 <u> </u> .
	Notary Public	
NOTE: Where an individual has subr	mitted a bid, the name of the individual should appear	here. Where

an individual signs for a partnership the name of the partner signing for the partnership should appear together with the name of the partnership. Where corporation has submitted a bid, the name of the officer, his position and the name of the corporation should appear.

\* Complete either liability or non-liability form but not both.

(This page may be photocopied, but not retyped)

# Contractor Equal Employment Opportunity Certification

During the performance of this contract, the undersigned agrees as follows:

- 1. The undersigned will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The undersigned will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The undersigned agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this equal opportunity (federally assisted construction) clause.
- 2. The undersigned will, in all solicitations or advertisements for employees placed by or on behalf of the undersigned, state the all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.
- 3. The undersigned will send to each labor union or representative of workers, with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representative of the undersigned's commitment under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- 4. The undersigned will comply with all provisions of Executive Order No. 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- 5. The undersigned will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and relevant orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records and accounts by the administering agency of the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- 6. In the event of the undersigned's non-compliance with the equal opportunity (federally assisted construction) clause of this contract of with any of the said rules, regulations, or orders, this contract may be canceled, terminated or suspended in whole or in part, and the undersigned may be declared ineligible for further Government contracts of federally assisted construction contracts in accordance with procedures authorized in Executive Order No. 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No 11246 of September 24, 1965, or by rules, regulations, or order of the Secretary of Labor, or as provided by law.
- 7. The undersigned will include this equal opportunity (federally assisted construction) clause in every subcontract or purchase order unless exempted by the rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order No 11246 of September 24, 1965, so that such provision will be binding upon each subcontract or vender. The undersigned will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for non compliance: Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor, as a result of such direction by the administering agency the undersigned may request the United States to enter into such litigation to protect the interest of the United States.

(Signature)		(Date)
	(Name and Title of Signer, Please type)	

#### **BIDDER'S PROFILE**

\*This form must be submitted with each bid in order for the bid to be deemed responsive.

Bidder's Name			
Bidder's Address			
Project being bid			

The Stark County Land Reutilization Corporation (Land Bank) may consider certain factors when analyzing bids for the awarding of capital improvement projects. Pursuant to the law of the State of Ohio the Land Bank may determine that the lowest bid is not necessarily the best bid. The Land Bank reserves the right to reject in whole or in part any or all bids, to waive any technicalities, to advertise for new bids, to accept any proposal or combination of proposals which is deemed most favorable to the Land Bank at the time and under the conditions stipulated, or to proceed with the work when the best interests of the Land Bank will be promoted thereby.

1. List **public projects** currently in progress or completed in the past 3 years by your firm. (If there are more than 10, list the 10 largest.)

Owner (Entity)	Type of Project	Bid Price	Final Price	Contact Person	Phone Number

- In the preceding 12 months, has your company completed all of its public contracts by the original completion date? Yes \_\_\_\_\_\_ No \_\_\_\_\_
  If not, what was the project and explain? \_\_\_\_\_\_
- 3. Please complete the following work history for all projects in the preceding 12 months.

Project	Original Contract Price	Cost of Change Order or Overrun	Reasons for Change Order or Overrun

- 4. Has your company ever worked on a project for Stark County before? Yes \_\_\_\_\_\_ No \_\_\_\_\_ If yes, what was the project and when was it performed? \_\_\_\_\_\_
- 5. Please complete the following equipment profile.

Make	Model	Size	Age	Quantity

6. If you do not have the necessary equipment for this project, how do you intend to obtain it?

7. List the names of material suppliers and subcontractors used currently or recently on projects most similar to the one being bid.

Supplier	Address	Contact Person	Phone Number
Subcontractor	Address	Contact Person	Phone Number

- 8. How many years has this firm been in business under its present name?
- 9. If the firm has been in business under any other name(s), please list.

10. Who is the owner of the firm? 11. Does the owner own any other construction businesses? Yes \_\_\_\_\_ No \_\_\_\_\_ If yes, please list. 12. Has ownership of this company changed in the past five years? Yes \_\_\_\_\_\_ No \_\_\_\_\_ If yes, list prior owners. 13. Are you able to provide the appropriate surety bond? Yes \_\_\_\_\_\_ No \_\_\_\_\_ Is your firm currently in bankruptcy? Yes \_\_\_\_\_\_ No \_\_\_\_\_ 14. Has this firm or any other firm owned by the same owner been in bankruptcy in the past 5 years? Yes No\_\_\_\_\_ 15. Has your company ever sued or been sued by a public entity over a public project? Yes No If yes, give a brief explanation.

16.	In the past 5 years, have any performance bonds been activated against your company by owners/supervisors of projects? Yes No If yes, who activated the bond and when?
17.	In the past 5 years, have you had to forfeit any contract? Yes No No If yes, who was the contract with and when did this occur?
18.	In the past 5 years, has your company been cited for violations of unemployment laws? Yes No If yes, explain
19.	In the past 5 years, has your company been cited for violations of workers' compensation laws? Yes No If yes, explain
20.	In the past 5 years, has your company been cited for violations of federal or state prevailing wage laws? Yes No If yes, explain
21.	In the past 5 years, has your company been cited for violations of the Fair Labor Standards Act (FLSA)? Yes No If yes, explain
22.	In the past 5 years, has your company been cited for violations of Occupational Safety and Health Administration (OSHA) regulations? Yes No If yes, explain (Were the OSHA violations resolved?) Yes No

23. Please complete the following employee profile.

Trade	# of Employees	Avg years experience	Avg years w/ this company	Apprenticeship program

24.	. Have you or any of your employees completed the 40-hr OHSA Hazardous Waste		
	Operations and Emergency Response (29 CFR 1910.120) (HAZWOPER) training course?		
	Yes No		
	If Yes, have you or any of your employees received their HAZWOPER certification?		
	Yes No		
25.	Are your company headquarters located in Stark County? Yes No If yes, list address		
26.	How many of the employees employed by you currently are residents of Stark County? Number =		
27.	Provide the company's valid UEI as issued by SAM.gov:		
I herel and fu questi	by attest to the accuracy of the answers I have given in the preceding Bidder's Profile orther attest to the fact that I am in a position to know the correct answers to these ions or have ascertained the correct answers from others in my company.		
I herel and fu questi Signati	by attest to the accuracy of the answers I have given in the preceding Bidder's Profile orther attest to the fact that I am in a position to know the correct answers to these ions or have ascertained the correct answers from others in my company.		
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I herel and fu questi Signati	by attest to the accuracy of the answers I have given in the preceding Bidder's Profile in the rattest to the fact that I am in a position to know the correct answers to these ions or have ascertained the correct answers from others in my company. ure and Title or type the name signed above County of		
I herel and fu questi Signati Print o Before	by attest to the accuracy of the answers I have given in the preceding Bidder's Profile in the rattest to the fact that I am in a position to know the correct answers to these ions or have ascertained the correct answers from others in my company. ure and Title or type the name signed above County of		
I herel and fu questi Signati Print o Before and th	by attest to the accuracy of the answers I have given in the preceding Bidder's Profile in the ratest to the fact that I am in a position to know the correct answers to these ons or have ascertained the correct answers from others in my company. 	, 20	

## **BID GUARANTY**

Each bid shall be accompanied by a bid guaranty in one of the following two forms:

#### **BID GUARANTY - FORM 1**

A bid guaranty bond for the full amount of the bid, including all additive alternates, conditioned to:

- 1. Provide that, if the bid is accepted, the bidder will, after the awarding of the contract, enter into a proper contract in accordance with the bid, plans, details, specifications, and bills of material. If for any reason, other than as authorized by Sections 9.31 or 153.54(G), Ohio Revised Code, the bidder fails to enter into the contract, and the Stark County Land Reutilization Corporation (SCLRC) award the contract to the next lowest bidder, the bidder and the surety on his bond shall be liable to the SCLRC for the difference between his bid and that of the next lowest bidder, or for a penal sum not to exceed ten (10) percent of the amount of the bond, whichever is less. If the Stark County Land Reutilization Corporation does not award the contract to the next lowest bidder but resubmits the project for bidding, the bidder failing to enter into the contract and the surety on his bond shall, except as provided in Section 153.54 (G), Ohio Revised Code, be liable to the SCLRC for a penal sum not to exceed ten (10) percent of the amount of the bid or the costs in connection with the resubmission of printing new contract documents, required advertising, and printing and mailing notices to prospective bidders, whichever is less.
- 2. Indemnify the SCLRC against all damage suffered by failure to perform the contract according to its provisions and in accordance with the plans, details, specifications, and bills of material therefore and to pay all lawful claims of subcontractors, materialmen, and laborers for labor performed or material furnished in carrying forward, performing, or completing the contract; and agree and assent that this undertaking shall be for the benefit of any subcontractor, materialman, or laborer having a just claim, as well as for the SCLRC.

The bond form shall be the SCLRC's Bid Guaranty Bond, and, recovery of any claimant thereunder shall be subject to Section 153.01 to 153.60, Ohio Revised Code, to the same extent as if the provisions of such Sections were fully incorporated in said bond form.

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The Bid Guaranty Bond Specifications provide the Stark County Land Reutilization Corporation's requirements for said Bond and its accompanying Power of Attorney form.

## BID GUARANTY - FORM 2

A bid guaranty of certified check, cashier's check, or letter of credit pursuant to Chapter 1305, Ohio Revised Code, equal to ten (10) percent of the bid, including all additive alternatives.

Such letter of credit shall be revocable only at the option of the Stark County Land Reutilization Corporation.

All such guaranties shall be made payable to the Stark County Land Reutilization Corporation.

The bid guaranty shall be conditioned to provide that if the bid is accepted, the bidder, will, after the awarding of the contract, enter into a proper contract in accordance with the bid, plans, details, specifications, and bills of material.

If for any reason, other than as authorized by Sections 9.31 or 153.54 (G), Ohio Revised Code, the bidder fails to enter into the contract, and the Stark County Land Reutilization Corporation (SCLRC) award the contract to the next lowest bidder, the bidder shall be liable to the SCLRC for the difference between his bid and that of the next lowest bidder, or for a penal sum not to exceed ten (10) percent of the amount of the bid, whichever is less. If the Stark County Land Reutilization Corporation does not award the contract to the next lowest bidder but resubmits the project for bidding, the bidder failing to enter into the contract shall, except as provided in Section 153.54 (G), Ohio Revised Code, be liable to the SCLRC for a penal sum not to exceed ten (10) percent of the amount of the bid or the costs in connection with the resubmission, of printing new contract documents, required advertising, and printing and mailing notices to prospective bidders, whichever is less.

If the bidder enters into the contract, the bidder shall, at the time he enters into the contract, file a performance bond for the amount of the contract to indemnify the SCLRC against all damage suffered by failure to perform the contract according to its provisions and in accordance with the plans, details, specifications, and bills of material therefore and to pay all lawful claims of subcontractors, materialmen, and laborers for labor performed or material furnished in carrying forward, performing, or completing the contract; and agree and assent that this undertaking shall be for the benefit of any subcontractor, materialmen, or laborer having a just claim, as well as for the SCLRC.

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The performance bond shall be in substantially the form of the SCLRC's (Sample) Performance Bond, and recovery of any claimant thereunder shall be subject to Sections 153.01 to 153.60, Ohio Revised Code, to the same extent as if the provisions of such Sections were fully incorporated in said bond form.

The Performance Bond Specifications provide the SCLRC's requirements for said Bond and its accompanying Power of Attorney form.

The certified check, cashier's check, or letter of credit filed with bids will be returned to the successful bidder upon filing of the performance bond described above.

## **GUARANTIES PAYABLE TO/BENEFIT OF/ISSUED BY**

All FORM 2 bid guaranties shall be payable to the Stark County Land Reutilization Corporation, shall be for the benefit of the SCLRC or any person having a right of action thereon, and shall be deposited with, and held by, the Stark County Land Reutilization Corporation. All bid guaranty and performance bonds shall be issued by a surety company authorized to do business in Ohio.

# **RETURN OF BID GUARANTIES**

All checks and letters of credit will be returned to successful bidders immediately after the contract is executed.

The check or letter of credit will be returned to the successful bidder upon his filing a satisfactory performance bond.

In the event of rejection of bids, all checks and letters of credit will be returned to the bidders immediately.

Bid guaranty bonds will be returned to unsuccessful bidders upon request.

# **EXECUTION OF CONTRACT**

Where the Stark County Land Reutilization Corporation accepts a bid but the bidder fails or refuses to enter into a proper contract in accordance with the bid, plans, details, specifications, and bills of material within sixty (60) days after receipt or notification of award, the bidder and the surety on any bond shall, except as provided in Section 153.54(G), Ohio Revised Code, be liable for the amount of the difference between his bid and that of the next lowest bidder, but not in excess of the liability specified in Section 153.54(B)(1) or 153.54(C), Ohio Revised Code.

Entering into "a proper contract" means that within 60 days after receipt of the SCLRC's notification of award, the successful bidder shall file with the SCLRC's Administrator the following documents <u>exactly in the</u> manner specified:

- 1. Signed Contract, with Certified Corporate Resolution or notarized statement of Partnership or as Sole Owner.
- 2. A performance bond for the full amount of the Contract...if the bid guaranty was a certified check, or letter of credit.
- 3. Certificate of Insurance
- 4. Current Ohio Worker's Compensation Certificate
- 5. An affidavit in conformance with ORC Section 5719.042 stating the bidder had no delinquent personal property taxes at the time of the bid (form to be supplied by the SCLRC).

Upon failure to file the documents listed above, in the form and manner specified by the SCLRC within said 60 days, the bidder and the surety on any bond shall be liable to the SCLRC in an amount not to exceed ten (10) percent of the bid...and the Stark County Land Reutilization Corporation will award the contract to the next lowest bidder or readvertise for same.

## DEFINITIONS

The following may be used interchangeably in the specifications:

SCLRC/Land Bank/Stark County Reutilization Corporation/Owner Bid/Proposal Project/Work

#### **UNIT PRICES**

When unit prices are requested, the following applies:

The unit prices specified in the unit price bid column will govern the award of the contract. The bidder shall make the calculations in the total amount bid column and also add up the total. However, the unit price specified together with the approximate quantities shall determine the total amount of the bid. If there is an error made in the extensions by the bidder the total shall be changed as only the unit prices shall govern.

#### ADDENDUM

Any interpretation, correction or change in the plans and specifications will be made by addendum. When an addendum is required the Environmental Consultant, or the Land Bank, will forward it to those who earlier obtained a complete set of plans and specifications, 1) by certified mail, return receipt requested, 2) by personal delivery, obtaining a signed receipt for same, or 3) electronic mail. No addendum will be issued to bidders having incomplete sets of plans and specifications.

# BID GUARANTY BOND (and Performance Bond)

KNOW ALL MEN BY THESE PRESENTS:

## (Name & full mailing address of Surety)

as Surety, hereinafter called Surety, and hereby held and firmly bound unto the Stark County Land Reutilization Corporation, as Obligee in the penal sum of the dollar amount of the bid submitted by the Principal to the Obligee on the project the \_\_\_\_\_\_ day of \_\_\_\_\_\_

\_\_\_\_\_\_, 20\_\_\_\_\_to undertake the Project known as \_\_\_\_\_\_

, The penal sum referred to herein shall be the dollar amount of the principal's bid to the Obligee, incorporating any additive or deductive alternate proposals made by the Principal on the date referred to above to the Obligee, which are accepted by the Obligee. For the payment of the penal sum well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that whereas the Principal has submitted a bid for the Project.

NOW, THERFORE, if the Obligee accepts the bid of the Principal and the Principal fails to enter into a proper contract in accordance with the bid, plans, details, specifications, and bills of material; and in the event the Principal pays to the Obligee the difference not to exceed then

(10) percent of the penalty hereof between the amount specified in the bid and such larger amount for which the Obligee may in good faith contract with the next lowest bidder to perform the work covered by the bid; or in the event the Obligee does not award the contract to the next lowest bidder and resubmits the project for bidding, the Principal pays to the Obligee the difference not to exceed ten (10) percent of the penalty hereof between the amount specified in the bid, or the costs, in connection with the resubmission, of printing new contract documents, required advertising, and printing and mailing notices to prospective bidders, whichever is less, then this obligation shall be null and void, otherwise to remain in full force and effect; if the Obligee accepts the bid of the Principal and the Principal within ten (10) days after receipt of notification of award of the contract enters into a proper contract in accordance

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#### BID GUARANTY BOND – (Cont'd)

with the bid, plans, details, specifications, and bills of materials, which said contract is made a part of this bond the same as though set forth herein;

NOW ALSO, if the said Principal shall well and faithfully do and perform the things agreed by the Principal to be done and performed according to the terms of said contract; and shall pay all lawful claims of subcontractors, materialmen, and laborers, for labor performed and materials furnished in the carrying forward, performing, or completing of said contract; we agreeing and assenting that this undertaking shall be for the benefit of any materialman or laborer having a just claim, as well as for the Obligee herein; then this obligation shall be void; otherwise the same remain in full force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

Upon the execution of the proper contract specified herein, the said Bid Guaranty Bond shall constitute and be a Performance Bond as provided herein and in accordance with the statutes of the State of Ohio.

The said surety hereby stipulates and agrees that no modifications, omissions, or additions, in or to the terms of the said contract or in or to the plans or specifications therefore shall in any wise affect the obligations of said Surety on its Bond.

Signed this	day of	<i>,</i> 20 <u>.</u> .	
PRINCIPAL:			
Ву:			(1)
Title:			
Surety:			
By:			
Witness of Attorney-In-Fact		Attorney-In-Fact	

(Full mailing address)

(1) Signed by the same one or two Officials who will be signing the contract. Facsimile signatures are not acceptable.

(This Bond may be photocopied, but not retyped)

## **BID GUARANTY BOND SPECIFICATIONS**

(An improperly executed Bond may result in a bid being rejected. Bidders should provide their Surety with these Specifications and the SCLRC's Bid Guaranty Bond form.)

The Bid Guaranty Bond shall be for the full amount of the bid, including all additive alternates, or combined bids, and executed <u>exactly in accordance</u> with the following specifications:

Bond shall be issued by a surety company authorized to do business in Ohio. The bond form shall be the SCLRC's Bid Guaranty Bond.

No time limit for the instituting of suit shall be added to the Bond form. Identification of Project shall be listed on the Bond.

As Principal, the Bond shall be signed by the same one or two Officials authorized to sign the construction contract.

<u>All signatures shall be original signatures</u>. Facsimile signatures are not acceptable.

The Surety's Power of Attorney and authorization to do business in Ohio, shall be attached to the Bond.

## POWER OF ATTORNEY SPECIFICATIONS

The amount of the Bond, or a sum in excess of that amount, must appear on the Power of Attorney form, to show that this is the amount for which the Attorney-in-Fact is authorized to sign the Bond...or it shall be assumed that the Attorney-in-Fact has unlimited such authority.

#### All signatures shall be executed in one of the following forms:

- 1. Power of attorney executed with original signatures;
- 2. A copy of the original power of attorney duly certified by proper corporate officers;
- 3. A duplicate power of attorney which is a reproduction of the <u>entire</u> original power of attorney produced photographically, chemically, or by other equivalent techniques that accurately reproduces the original.

<u>NOTE</u>: Blank unexecuted powers of attorney to which facsimile "rubber stamped" signatures have been affixed <u>are not acceptable</u>.

All dates shall be completed as indicated.

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# **BID SPECIFICATIONS**

# 2433 COLUMBUS ROAD, CANTON, OHIO 44705

# EXCAVATION OF CLEAN OVERBURDEN AND PETROLEUM CONTAMINATED SOILS

# 5/27/2025

# **1.0 INTRODUCTION**

Provided herein are the specifications for a soil excavation project to be conducted at the property located at 2433 Columbus Road in Canton, Ohio

This project is funded by an Ohio Department of Development Brownfield Remediation Grant. The contractor will contract directly with Stark County Land Reutilization Corporation (SCLRC).

The site was developed for use as a gas station in the early 1970s and ceased operations between 2007 and 2008. Owned by Stark County Land Reutilization Corporation, the subject property is currently vacant.

The materials removal scope of work for this project shall include the following general remedial tasks.

- 1. Excavation, hauling, and disposal of petroleum contaminated soils (PCS) and backfilling of excavation;
- 2. Mixing of groundwater remediation materials to exposed groundwater within exposed excavated cavity prior to backfilling activities.

PANDEY Environmental, LLC (PANDEY) is providing oversight for the project on behalf of Stark County Land Reutilization Corporation (SCLRC). Jason Martin, Project Manager for PANDEY can be reached at 614-444-8078 ex. 203 or at <u>jmartin@pandeyenvironmental.com</u>.

# 2.0 PROPERTY BACKGROUND

The subject property is approximately 1.2 acres, located on the north side of Columbus Road NE (state route 62) in a dominantly commercial and residential neighborhood of Canton, Ohio. The property historically was developed as a Starfire gas station until operations ceased between 2007 and 2008.

Currently, the property is vacant and previously housed a gas station and one building, approximately 448 square feet in size that was constructed in 1971. No operations or generation of waste are occurring at the property. The southern portion of the property is paved. Nimishillen Creek is located approximately 0.5 mile west of the subject property. Adjacent to the north are residences. Adjacent to the south are commercial fronts including Atlantic Pools, Inc. and Bob's Auto Sales, along with residences. Adjacent to the east is Carlisle's used car dealership and to the west is Three Sons Mattress.

The subject property's historical use included the utilization of underground storage tanks (USTs), handling of hazardous substances and the presence of asbestos containing materials (ACM). Adjoining properties are commercial and residential in current uses.

In July of 2020, PANDEY Environmental, LLC (PANDEY) removed three (3) underground storage tanks (USTs) from the subject property. The USTs were used for historic site filling station operations which ceased in 2008. The property has been vacant since operations ceased. Closure activities (performed in July, 2020) included the removal of the on-site UST system including the two dispenser islands, single diesel dispenser, all associated piping and three (3) USTs. The three (3) USTs removed from the site included two 12,000-gallon gasoline tanks and a single 12,000-gallon diesel tank which were all situated in a single tank cavity located on the northwestern portion of the former gas station operations area.

A Remedial Action Plan (RAP), dated December 16, 2022 and revised March 6, 2023, was developed by PANDEY that outlined planned remedial activities at the property and was subsequently approved by the Bureau of Underground Storage Tank Regulations (BUSTR) on June 9, 2023. Remedial activities include the removal of petroleum contaminated soils from the property and the introduction of remedial agents into the groundwater. The BUSTR approved RAP is included as Attachment 4 of this document.

# **3.0 PROJECT DESCRIPTION**

As summarized above, the subject property is the location of a historic Starfire gas station. Previous investigations performed across the property confirmed the presence of petroleum contaminated soils beneath the ground surface. The project scope consists of four (4) primary objectives:

- 1. Removal and stockpiling of presumed clean overburden;
- 2. Removal, stockpiling, and disposal of petroleum contaminated soils;
- 3. Mixing of groundwater remediation materials to exposed groundwater;
- 4. Backfilling of excavation area.

Details regarding these primary objectives are summarized below followed by general site requirements.

# Removal of Presumed Clean Overburden (Approximately 0-12'):

Historical operation at the property included the operation as a gas station from the early 1970's through the late 2000's. Several historic environmental site assessments indicate that historic site operations have caused soil and groundwater contamination. This contamination presumably originated from buried Underground Storage Tanks (USTs) that have since been removed from the subject property. The area requiring remediation is in the southwestern portion of the subject property. The lateral extent of the remediation area is anticipated to be an area of approximately 80' x 60'. The anticipated area of remediation is displayed on the figure included in Attachment 2 of this document. Historic environmental site assessments performed at the property indicate that soils within the 0-12' depth interval are unimpacted by petroleum contamination. Therefore, soils within this depth interval are presumed "clean" and will be excavated and stockpiled near the excavation area to await laboratory sampling analysis to determine re-use capabilities. The estimated quantity of presumed unimpacted overburden is approximately 2,133 cubic yards.

\*It should be noted that PANDEY personnel will be present to observe excavation as it progresses. It is possible that petroleum contaminated soils will be encountered at depths slightly shallower or slightly deeper than 12' in areas other than where historic environmental sampling has been conducted and approximate cubic yardage of overburden may vary slightly from the estimated total listed within this document. Therefore, PANDEY personnel will direct the contractor which soils should be considered overburden and require segregated stockpiling.

PANDEY personnel will collect soil samples from the overburden stockpile for laboratory submittal. A period of approximately fourteen (14) days will be allotted following the collection overburden stockpile samples for the completion and review of laboratory analytical data. If laboratory analysis allows the on-site re-use of these overburden soils, then these soils will be returned to the excavation cavity as backfill. If laboratory analysis of overburden soils does not allow for on-site re-use, these soils will be disposed of off-site along with petroleum contaminated soils.

# Removal of Petroleum Contaminated Soils (Approximately 12-33'):

Soils within the depth interval of 12' below ground surface (bgs) down to groundwater at depths ranging from 28' - 30' bgs are presumed impacted by petroleum. An additional three (3) feet past groundwater of saturated soils will also be excavated. The estimated quantity of these petroleum contaminated soils is 3,733 cubic yards. All petroleum contaminated soils will be stockpiled separately from the overburden soils to await completion of all excavation activities.

\*As stated above, PANDEY personnel will be present to observe excavation as it progresses. It is possible that petroleum contaminated soils will be encountered at depths slightly shallower or slightly deeper than 12' in areas other than where historic environmental sampling has been conducted and approximate cubic yardage of petroleum contaminated soils may vary slightly from the estimated total listed within this document. Therefore, PANDEY personnel will direct the contractor when soils should be considered petroleum contaminated soils and require segregated stockpiling.

Transportation and disposal of petroleum contaminated soils should not occur until all excavation activities have been completed and all overburden and petroleum contaminated soils have been stockpiled. At that time, all analytical data for overburden soils should have been reviewed and the potential on-site re-use or disposal requirements will have been determined.

It should be noted that Petro Environmental (Lodi Petro Cell), located at 8200 Seville Rd., Lodi, OH 44254, has previously approved the acceptance of the petroleum contaminated soils. However, another licensed disposal facility may be chosen by the contractor. If another disposal facility is chosen by the contractor, PANDEY must be notified which facility is selected prior to the commencement of disposal activities. If Lodi Petro Cell is chosen, the contractor is also responsible for confirming with Lodi Petro Cell that the soils can be disposed at their facility. Soil analytical data for soils to be excavated and disposed is included in Attachment 6 of this document.

# Mixing of Groundwater Remediation Materials:

Following the completion of excavation activities, groundwater will be exposed at the base of the excavation area. While exposed, a groundwater remediation agent will be introduced to the exposed groundwater and thoroughly mixed. The material Provect-OX<sup>®</sup> was chosen as the groundwater remediation agent for this project. Provect-OX<sup>®</sup> is a dry, pre-mixed powder material that will rapidly oxidize contaminants of concern in the groundwater. PANDEY will be responsible for providing the Provect-OX<sup>®</sup> material to the exposed groundwater within the excavation area and direct mixing of the treated groundwater. Application of the agent and mixing of the treated groundwater can be accomplished with the bucket of the excavator. Documentation containing details on the Provect-OX<sup>®</sup> material is included as Attachment 5 of this document.

# **Backfilling Activities:**

Following removal of all petroleum contaminated soils, backfill will be required to return the site to original grade. The contractor will be responsible for identifying a site from where backfill will be obtained. Replacement, spreading, and compacting materials may not be left lower than the lowest elevation found in the vicinity of the excavation area in order to provide positive drainage. Backfill material should consist of one of, or a combination of, the following: compactible, certified-clean (tested by a NELAC certified laboratory) cohesive soils such as silts or clays, certified clean fill sand, #304 crushed limestone, or #310 gravel. It should be noted that approximately two (2) weeks of lead time is required for completion of analytical testing results for the backfill material if cohesive soil backfill (silts or clays) material is chosen for use. The backfill materials #304 crushed limestone and #310 gravel do not require analytical testing for use at the site. The backfill material certified clean sand can be tested in place as fill sand is presumed certified clean. During backfilling activities, compaction activities should be conducted to ensure that settling does not occur at the property. Compact backfill in lifts not to exceed 12 inches loose or 6 inches compacted. Lifts should be compacted with the bucket of the excavator until it can be deemed safe for larger equipment to compact backfill material by tracking passes within the excavation area. At completion of backfilling, the site must be finished with gravel in all excavated areas.

PANDEY personnel will be providing oversight during all remedial activities, including petroleum contaminated soil (PCS) removal, PCS disposal and manifesting, introduction and mixing of groundwater remediation agent, and backfilling. Disposal manifests must be returned to PANDEY on a weekly basis at a minimum during disposal activities.

# **General Requirements / Considerations:**

A Storm Water Pollution Prevention Plan (SWP3) is not required for the subject property as the excavation area is less than one (1) acre. However, standard construction site practices should be implemented by the contractor to limit stormwater runoff. This can include straw bales, silt fences, sediment barriers, and/or storm drain inlet protection.

The existence of petroleum contaminated soils in the subsurface may release harmful vapors in the form of such Volatile Organic Compounds (VOCs) like benzene, toluene, ethylbenzene, and xylenes. During excavation activities, air monitoring will be performed by PANDEY with a Photoionization Detector (PID) capable of detecting ranges of VOCs in parts per million (PPM). The PID unit will be calibrated on a daily basis prior to the commencement of excavation activities. Due to the nature of the work being performed, active air monitoring will be performed by a PANDEY representative during all excavation activities. If concentrations of VOCs are observed in excess amounts (greater than 10 ppm) in ambient air during excavation activities, work will be halted and the area will be vacated until ambient air concentrations return below excess amounts and work will be resumed. Therefore, no respiratory personal protection equipment (PPE) will be required. All work activities will be conducted in Level D PPE (standard construction work clothing).

During excavation activities, several soil samples will be collected by PANDEY from each sidewall of the excavation area. The contractor will aid PANDEY personnel in the collection of sidewall samples with the use of the excavator bucket. A period of approximately fourteen (14) days will be allotted following the collection of sidewall samples for the completion and review of laboratory analytical data prior to the commencement of backfilling activities.

Any areas previously occupied by grass where the grass was destroyed due to activities related to this project will require reseeding and straw cover following the cessation of excavation area backfilling and disposal of petroleum contaminated soils activities.

# 4.0 ESTIMATED QUANTITIES AND EXTENT OF MATERIAL

An area measuring approximately 60' x 80' will be designated as the excavation area and will be excavated down to groundwater plus three (3) feet for a total excavation depth of approximately thirty (30) feet. The top twelve (12) feet (0-12') is presumed to be clean overburden and will be excavated and stockpiled to await analytical testing for re-use as backfill material. The remaining soils (12-33') will be presumed petroleum comminated soils (PCS) and will be excavated, stockpiled, and managed accordingly. The excavation area in relation to site layout is displayed on Attachment 2. Quantities of disposal materials and associated backfill were estimated in cubic yards. When approximating tonnage, a conversion factor of 1.5 will be applied, i.e., 1 cubic yard = 1.5 tons.

Material to be Excavated	Location(s)	Approximate Quantity
Presumed Clean Overburden	Excavation Area $(60'x \ 80') = 0.12'$ Depth	2,133 cubic yards
Petroleum Contaminated	Excavation area $(60' \times 80') =$	3.733 cubic vards
Soils	12-33' Depth	
Material to be Imported	Location(s)	Approximate Quantity
Clean Fill	Excavation Area	<ul><li>3,733 cubic yards (minimum if clean 0-</li><li>12' overburden can be used as backfill)</li></ul>
		5,866 cubic yards (maximum if no overburden can be used as backfill)

Details regarding analytical results for PCS within the excavation area are included in Attachment 4. <u>Regardless of the depth of excavation, all soils will be stockpiled, sampled, and then either disposed or used as backfill in the excavated area.</u>

# 5.0 SCOPE OF WORK SUMMARY / REMEDIATION REQUIREMENTS

To be considered for performance on this project, the Contractor is requested to comply with the following requirements/conditions:

- This project is grant funded in part by the Ohio Department of Development Brownfield Remediation Program. Therefore, the project is subject to prevailing wage rates for work as required by the Ohio Revised Code, Chapter 4115.
- The Contractor will be paid net 60 days upon receipt of invoice. Monthly invoices will be acceptable.
- Excavation workers at the property should follow applicable HAZWOPER requirements described in OSHA standard 29 CFR 1910.120. Furthermore, all workers performing excavation activities are required to have completed the 40-hr OSHA Hazardous Waste Operations and Emergency Response (29 CFR 1910.120) (HAZWOPER) training course and received their HAZWOPER certifications prior to commencing work. All HAZWOPER certifications must be provided to PANDEY for all contractor employees performing excavation activities at the subject property prior to the employee commencing excavation activities.
- A formal Storm Water Pollution Prevention Plan (SWP3) is not required. However, standard construction site practices should be implemented by the contractor to limit stormwater runoff. This can include straw bales, silt fences, sediment barriers, and/or storm drain inlet protection.
- The contractor shall provide appropriate fencing at the subject property boundary encompassing all necessary work areas with a lockable entrance / exit gate. Additionally, excavation areas should be properly secured within the fenced-in area. Fencing shall remain in place until backfilling activities have been completed and the excavation area has been returned to original grade.
- The Contractor will be responsible for securing the site and excavation area at the end of each work day. This includes ensuring the entrance gate is closed and locked and the excavation area is secured during times of inactivity.
- All presumed clean overburden soils (soils at depths of approximately 0' to 12') are to be excavated and stockpiled on-site to await analytical testing for re-use. The total volume requiring excavation is estimated to be approximately 2,133 cubic yards as outlined in the table above. If analytical testing allows re-use of overburden soils, then these soils will be backfilled into the excavation cavity. If these soils, or any portion of these soils, fail re-use standards, then these soils will require transportation and disposal off-site similar to petroleum contaminated soils.
- All petroleum contaminated soils (soils at depths of approximately 12' to 33' are to be excavated and stockpiled on-site to be hauled off-site following completion of the excavation process or returned to the cavity. The total volume requiring excavation is estimated to be approximately 3,733 cubic yards as outlined in the table above. The Contractor will be paid on a per ton basis for the transportation and disposal of these materials according to tonnage totals provided by the disposal facility.

- The Contractor is responsible for disposal costs of the petroleum contaminated soils. Excavated petroleum contaminated soils (approximately 3,733 cubic yards) needing disposal must be hauled off-site for disposal at a licensed disposal facility. Petro Environmental (Lodi Petro Cell), located at 8200 Seville Rd., Lodi, OH 44254, has previously approved the acceptance of the petroleum contaminated soils but the Contractor is not required to dispose the petroleum contaminated soils at this facility. If another facility is chosen, the contractor must notify PANDEY of the disposal facility prior to commencement of disposal activities. Additionally, a waste profile for the disposal facility must be setup and provided to PANDEY prior to work commencing.
- Shipping manifests and/or chain of custody documentation shall be submitted by the Contractor to the Owner's Representative (PANDEY).
- All excavated areas will be replaced with compactable, certified-clean (tested by PANDEY prior to approval of the source and analyzed by a NELAC certified laboratory) cohesive soils (silts and clays), certified clean fill sand, #304 crushed limestone, or #310 gravel. A minimum lead time of two (2) weeks is required following identification of a backfill source for analytical testing if the backfill source is of a cohesive soils.
- The Contractor will be paid for backfill material based on a per cubic yard basis according to estimations of the excavated area requiring backfilled minus the volume of on-site overburden soils utilized for backfilling activities. Volume estimations will be based on the on-site destination excavated area after allowing for a compaction factor. All estimations must be agreed upon by PANDEY and the Contractor prior to importing backfill.
- The Contractor will be responsible for locating utility lines and for obtaining any necessary permits for performing the described work around existing utilities. Should any utility lines (i.e. electric, water, gas, drain tiles, etc.), anchor/sky wires, utility meters, etc. be damaged during the remedial excavation, the Contractor will be responsible for the repairs.
- Work hours for the project will be between 8am and 5pm, Monday through Friday. No weekend or night work will be allowed.
- At completion of backfilling, the Contractor will finish the excavation area with approximately 6" of gravel.
- The Contractor will provide all superintendence, labor, materials, tools, equipment, technologies, and specialized techniques necessary to perform the remedial excavation, transportation of materials off-site and placement of backfill materials.
- Precautions shall be exercised at all times for the protection of persons (including employees) and property. The safety provisions of applicable laws, and construction codes shall be observed.
- All grass areas destroyed by activities associated with this project will be reseeded and covered with straw.
- The Contractor shall assume full responsibility and liability for the compliance with all applicable federal, state and local regulations pertaining to work practices, hauling, disposal and protection of workers and visitors to the site.
- The work area shall be kept free of unnecessary equipment, supplies and debris. All excavated clean overburden materials shall be stockpiled and placed on plastic sheeting and covered with plastic sheeting to await analytical testing for re-use on site. Similarly, all excavated petroleum contaminated soils shall be stockpiled and placed on plastic sheeting and covered with plastic sheeting to await transportation and disposal.
- Prior to demobilizing, the Contractor shall visually inspect the work area to ensure that all areas are appropriately finished as described above.
- The Contractor must remove all barriers, equipment, devices, etc from the work area upon completion of the remedial project.
- The Owner's Representative (PANDEY) will provide constant oversight throughout the duration of the project to verify that all items of the planned remedial activities are implemented as described in this document.
- The Contractor must submit the following documents at the completion of the project:
  - 1. Daily Logs / Notes
  - 2. Disposal Manifests
  - 3. Copies of any permits obtained throughout the project

Sealed Bids in response to these Bid Specifications should be received by 4:00 PM on **June 10, 2025**, to the attention of:

Stark County Land Reutilization Corporation Attn: Sarah M. Peters 201 3<sup>rd</sup> Street NE, Suite 201 Canton, Ohio 44702

Submitted bids should be valid for a period of 60 days.

Contractor must meet the following insurance requirements;

For the duration of the project:

(a) Contractor agrees to maintain statutory worker's compensation coverage as required by law, and comprehensive general insurance coverage of \$2 million per occurrence. If comprehensive general and/or automotive liability coverage amounts are insufficient, the insufficiency can be made sufficient by umbrella liability coverage in the amount of or greater than the insufficiency. Subcontractor agrees to provide current Worker's Compensation and Liability Insurance verification with this signed contract.

(b) In addition to the above insurance requirements in (a), Contractor agrees to maintain Pollution Liability coverage of \$1 million per occurrence, Stop Gap Liability insurance coverage of \$1 million per occurrence, and Automotive Liability Insurance coverage of \$1 million per occurrence. If automotive liability coverage amounts are insufficient, the insufficiency can be made sufficient by umbrella liability coverage in the amount of or greater than the insufficiency.

(c) Subcontractor agrees to add PANDEY Environmental, LLC, 6277 Riverside Drive, Dublin, OH 43017 and Stark County Land Reutilization Corporation (SCLRC), 201 3<sup>rd</sup> Street NW, Canton, Ohio 44721 as a "Certificate Holder." A copy of the "Certificate of Liability Insurance" reflecting the required coverage's, and verifying PANDEY Environmental, LLC and SCLRC as a "Certificate Holder" is required. PANDEY Environmental, LLC and SCLRC must also be named as an "Additional Insured" on the General Liability, Auto and Pollution coverage's. A copy of the Additional Insured endorsement CG2010(10/01) or CG2037(10/01) a blanket endorsement or their equivalent must be attached to the Certificate. In addition, the "Cancellation Section" of the Certificate must be amended to read as follows: "Should any of the above described policies be cancelled before the expiration date thereof, the issuing insurer will mail a 30 days written notice to the certificate holder named to the left."

# 6.0 FORMAT FOR BID SUBMISSION

Please use the following general format for submission of bid. Submission via email is preferred.

- 1. Estimated Project Duration in days
- 2. Mobilization Fee(s)
- 3. Demobilization Fee(s)

4. Equipment / Operator Costs per day rate and estimated full project duration total (for each type of equipment: i.e. excavator, skid steer, equipment operator)

5. Itemized miscellaneous costs (i.e. perimeter fencing, stormwater runoff controls, utility locating services, gravel cover, etc.)

6. Transportation and Disposal Costs of Petroleum Contaminated Soils per ton rate

7. Backfill Material costs (transported, placed, and compacted) per cubic yard

#### Attachments:

Attachment 1: Property Location Map

Attachment 2: Property Layout Map

Attachment 3: Site Photographs

Attachment 4: BUSTR Approved Remedial Action Plan (RAP)

Attachment 5: Provectus Product Documentation

Attachment 6: Soil Analytical Data

ATTACHMENT 1 Property Location Map





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6277 Riverside Drive; Suite Two South Dublin, Ohio 43017 614-444-8078 www.pandeyenvironmental.com

Attachment 1

**Property Location Map** 

# ATTACHMENT 2 Property Layout Map



Excavation Area



Sampling and Analysis Plan 2433 Columbus Road NE Canton, Ohio 44705

> Figure 2 Property Layout Map

# **PANDEY** ENVIRONMENTAL, LLC

6277 Riverside Drive; Suite Two South Dublin, Ohio 43017 614-444-8078 www.pandeyenvironmental.com

# ATTACHMENT 3 Site Photographs

# Attachment 3 Site Photographs



Photo 1: Eastern portion of the site looking East.



Photo 2: Northern portion of the site looking North.

# Attachment 3 Site Photographs



Photo 3: Western portion of the site looking West.

# <u>ATTACHMENT 4</u> BUSTR Approved Remedial Action Plan (RAP)

# **Remedial Action Plan**

US Enterprises II 2433 Columbus Road, NE Canton, Ohio 44705 Release #76000333-N00002

# **Prepared by:**

PANDEY Environmental, LLC 6277 Riverside Drive, Suite Two South Columbus, OH 43017 Phone: 614-444-8078 www.pandeyenvironmental.com

# **Prepared for:**

Stark County Regional Planning Commission 201 3<sup>rd</sup> Street Northeast Canton, Ohio 44702

# **Date of Preparation:**

March 6, 2023

# PANDEY ENVIRONMENTAL, LLC

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- APPENDIX A Groundwater Remediation Documentation
  - Provectus Product Sheets
  - Provectus Case Study

#### **1.0** Introduction and Timeline

PANDEY Environmental, LLC (PANDEY) has completed closure assessment, tank pull, demolition, Bureau of Underground Storage Tank Regulation (BUSTR) Tier 1, and BUSTR Tier 2 activities at the property located at 2433 Columbus Road in Canton, Ohio. The following section is a summary of these assessment activities.

In July of 2020, PANDEY Environmental, LLC (PANDEY) removed three (3) underground storage tanks (USTs) from the subject property. The USTs were used for historic site filling station operations which ceased in 2008. The property has been vacant since operations ceased. Closure activities (performed in July, 2020) included the removal of the on-site UST system including the two dispenser islands, single diesel dispenser, all associated piping and three (3) USTs. The three (3) USTs removed from the site included two 12,000-gallon gasoline tanks and a single 12,000-gallon diesel tank which were all situated in a single tank cavity located on the northwestern portion of the former gas station operations area. All USTs were steel lined tanks which were cleaned and crushed on-site prior to being transported for ultimate off-site disposal. A total of two dispenser islands containing six gasoline dispensers were removed from the site as well as a single diesel dispenser which was located adjacently south of the tank cavity, west of the gasoline dispenser islands. All associated piping runs & dispensers were removed during closure activities. An overhead canopy which covered the dispenser islands was removed as well. Additionally, the former service station building was demolished, and all signage & guardrails related to former operations at the property were removed. The removal of the UST system occurred on July 9, 2020. The tanks were empty with the exception of some rainwater which had gathered in the bottom. The tanks were all power washed and the rinseate captured for off-site disposal. Closure samples were collected from the floors and sidewalls of the UST cavity, piping trenches and beneath the dispensers. Two (2) stockpiles were generated and sampled. Results of the sampling (summarized on the tables within this Closure Assessment) demonstrated that detections of chemicals of concern were below applicable BUSTR Reuse Action Levels. The remaining void space was backfilled with sand and the surface was finished with

approximately 6" to 12" of #304 gravel. PANDEY prepared and submitted a BUSTR Closure Assessment Report on August 17, 2020 which documented closure activities and findings. Results of the Closure Assessment determined that the former UST cavity containing the three (3) USTs showed detections of TPH (C6-C12) and 1,2,4-Trimethylbenzene above BUSTR Closure Action Levels. Additionally, a detection of Benzo(a)pyrene was observed along the gasoline piping run that exceeded BUSTR Closure Action Levels. Thus, the Underground Storage Tank Closure Assessment concluded that petroleum hydrocarbon contamination in concentrations above the applicable closure action levels is present in the soil on the western half of the property in the area of the former USTs cavity, former gasoline product lines and former gasoline dispenser islands. As a result, it was determined that a Tier 1 Source Investigation should be conducted for the BUSTR Release associated with this system, Release #76000333-N00002.

Following completion of the Closure Assessment, BUSTR submitted a letter on August 19, 2020 stating that a Tier 1 Source Investigation was required for the former on-site gasoline system (Release #76000333-N00002). The letter references the PANDEY Closure Assessment results, and stated that a Tier 1 Source investigation must be performed at the site with either a Tier 1 Notification report or Tier 1 Evaluation form being completed for the property.

On September 16, 2020, PANDEY performed a Tier 1 Source Area Investigation at the site with the installation of several soil bores and monitoring wells. Results of the sampling event detected concentrations of TPH (C6-C12) and 1,2,4-Trimethylbenzene above applicable BUSTR Delineation Action Levels in the collected soil samples, and concentrations of 1,2,4-Trimethylbenzene above BUSTR Delineation Action Levels in collected groundwater samples. Thus, it was determined that a Tier 1 Delineation be performed, and a Tier I Notification form be completed for the property.

On December 28, 2020, PANDEY performed a Tier 1 Delineation at the site with the installation of additional soil bores and monitoring wells around the areas of the former

gasoline USTs cavity, product line area and former gasoline dispensers. Specifically, boring locations were favored to surround areas that previously failed applicable BUSTR Action Levels in the submitted Tier 1 Notification Report (dated October 28, 2020), and Closure Assessment report (dated August 17, 2020). Results of the sampling event did not detect any concentrations of BUSTR Group 1 or Group 2 parameters above applicable BUSTR Delineation Action Levels in the collected soil and groundwater samples. On March 2, 2021, PANDEY performed additional monitoring well installation as part of the Tier 1 Delineation at the site. This was performed at the request of BUSTR. Results of the sampling event did not detect any concentrations of BUSTR Delineation Action Levels in the collected soil and group 1 or Group 2 parameters above applicable BUSTR. Results of the sampling event did not detect any concentrations of BUSTR. Group 1 or Group 2 parameters above applicable BUSTR Delineation Action Levels in the collected soil and groundwater samples. Thus, it was determined that the previously identified contamination at the property was limited and had been successfully delineated to localized areas on the property. On April 2, 2021, the Tier 1 Investigation Report was approved by BUSTR and authorization was granted to proceed to a Tier 2 Evaluation.

On September 22, 2021, PANDEY performed a Tier 2 Evaluation at the site with the installation of soil bores in the central and western portions of the site and soil bores and monitoring wells off-property to the west. Soil sample collection on-property was performed in order to obtain geotechnical parameters, specifically Atterberg Limits, USGS classification and Grain Size Analysis for site-specific modeling purposes. Soil sample and groundwater sample collection off-property was performed in order to obtain Fractional Organic Carbon (FOC) data for site-specific modeling purposes and to obtain off-property groundwater data to satisfy BUSTR requests to investigate off-property contamination migration in groundwater. Furthermore, on-property monitoring wells exhibiting exceedances of chemicals of concern were re-sampled to obtain updated chemical concentration data. Results of the off-property groundwater sampling data indicated that contamination was not emanating off-property to the west. Additionally, on-property groundwater sampling data indicated that on-site monitoring wells in the central portion of the property continue to exhibit concentrations of chemicals of concern in exceedance of groundwater ingestion levels. On February 28, 2022, a Tier 2 Evaluation form was submitted to BUSTR for review.

On March 21, 2022, BUSTR issued a letter requesting additional information for the Tier 2 Evaluation that included modeling of more chemicals of concern and supplementary sampling. In order to satisfy comments issued by BUSTR, an additional monitoring well was installed to serve as a new Point of Demonstration (POD) well and groundwater samples were again collected from on-property monitoring wells exhibiting exceedances of chemicals of concern in order to establish if the groundwater contamination plume is stable. On August 22, 2022, an additional monitoring well was installed in the western portion of the site to serve and the new POD well and additional samples were collected from select monitoring wells. Results indicated that groundwater concentrations are fluctuating over time and the groundwater contamination plume is not stable. Additional information requested was submitted in letter format to BUSTR on October 12, 2022 and the Tier 2 Evaluation was subsequently approved by BUSTR. Pathways of chemicals of concern in excess of BUSTR standards would be addressed in a Remedial Action Plan.

The purpose of this Remedial Action Plan is to address pathways that exhibit risk in excess of BUSTR target levels and outline remedial activities that will either eliminate those pathways or will reduce concentrations of chemicals of concern to levels below BUSTR target levels.

PANDEY personnel responsible for preparation of this report include Mr. Atul Pandey, P.E., Senior Engineer, and Mr. Jason Martin, Project Manager.

#### 1.1 Summary of Activities/Pathways to be Addressed

Multiple areas of contamination at the subject property will be addressed in this remedial action plan on a specific pathway basis, as outlined in the following sections. Below is a summary of chemicals of concern in exceedance of BUSTR target levels for each pathway.

	Pathway	Chemical(s) of Concern	
	Direct Contact to Soil	Total Petroleum Hydrocarbons (TPH) (C6-C12)	
	Soil to Indoor Air	1,2,4-Trimethylbenzene, Benzene, 1,2-	
		Dibromoethane (EDB), 1,2-Dichloroethane	
Soil		(EDC)	
	Soil Leaching to	Benzene, Methyl-tert-butyl-ether, Naphthalene,	
	Drinking Water	1,2,4-Trimethylbenzene, 1,2-Dibromoethane	
		(EDB), 1,2-Dichloroethane (EDC)	
	Groundwater Direct	Benzene Ethylbenzene Nanhthalene 124-	
	Contact and Ingestion	Trimethylbenzene	
Groundwater	(on-property)	Timeurylochzene	
	Groundwater Ingestion	Benzene, Ethylbenzene, Naphthalene, 1,2,4-	
	(off-property)	Trimethylbenzene	

# **1.2 Property Boundaries**

The subject property for the purposes of this Remedial Action Plan consists of one (1) distinct parcel totaling approximately 1.2 acres. PANDEY previously completed a BUSTR Closure Assessment dated August 17, 2020, a Tier 1 Investigation dated January 29, 2021, and a Tier 2 Evaluation dated February 28, 2022 for the subject property. The property boundaries for all reports are identical and have not changed. The property boundary is shown on Figure 1. The property is bordered to the north by a private residence followed by additional residential properties, to the east by a used car dealership followed by additional commercial properties, to the west by a welding shop and mattress distributers followed by additional commercial properties, and to the south by Columbus Road followed by additional residential properties.

# **1.3 Proposed End Use**

The subject property was approved in the Tier 2 Evaluation to be defined to fit a nonresidential land use as part of a land use restriction. Non-residential land use is defined in Ohio Administrative Code ("OAC") 1301:7-9-13(C)(18) as "land use that does not meet the criteria for residential land use. Non-residential land use includes, but is not limited to, commercial and industrial land use." However, following the implementation of remedial action activities outlined in the sections below, the site is supposed to meet action and target levels for residential land use. Therefore, no land use restriction may be placed on the subject property following the implementation of remedial activities.

#### **1.4 Summary of Institutional Controls**

Following planned remedial activities at the subject property in the form of soil excavation and groundwater remediation, the subject property is planned to meet BUSTR action levels for residential land use for all associated pathways. Therefore, there are no planned institutional or engineering controls for the subject property.

#### 2.0 Soil Direct Contact Pathway

#### 2.1 Chemicals of Concern

Results of the soil sampling and modeling showed an exceedance of BUSTR Soil Direct Contact Non-Residential target levels for the compound TPH (C06-C12) in the sample T1SB1: 26-28' with a detection of 4,340 ppm and a direct contact standard of 1,000 ppm. Since TPHs are not pathway specific and cannot be eliminated by the direct contact pathway, the TPH detections above the BUSTR Soil Direct Contact Non-Residential target levels must be addressed via remediation. TPH detections above BUSTR Soil Direct Contact Non-Residential target levels are limited to the compound TPH (C06-C12) in the sample T1SB1: 26-28' and will be addressed with the remedial activities outlined in the following sections.

#### 2.2 Remedial Activities to be Implemented

The removal of petroleum contaminated soils through excavation is applicable during corrective action activities according to Section 4.2 of the BUSTR Technical Guidance Manual 2017. Excavation of impacted soils will be performed at the subject property in order to achieve compliance in the soil direct contact pathway. The extent of soil excavation was determined based on the following factors:

- The area planned to be excavated was centered around the location of T1SB1 where many of the site-wide maximum concentrations of chemicals of concern are located.
- A total of five (5) soil bores were advanced during the August, 2022 Tier 2 mobilization in the vicinity of the soil bore containing the maximum detections of chemicals of concern (T1SB1) in order to delineate the extent of petroleum impacted soils. Four (4) out of the five soil bore locations exhibited no detections of chemicals of concern and no evidence of petroleum staining and, therefore, are serving as planned clean edges and the extent of the excavation area.

- If a historic soil bore represented a potential concentration of a chemical of concern that may become the new site maximum that fails when compared to BUSTR action levels when the previous site maximum in T1SB1 is removed, this bore location was included in the proposed excavation area. This exercise was performed in order to provide a complete site-wide data set that will pass when compared to BUSTR action levels for the residential land use.
- The western property boundary was used as a natural excavation boundary as concentrations of chemicals of concern at the location T1MW3 near the property boundary exist at levels that could potentially fail when compared to BUSTR action levels for residential land use during pathway analysis. Therefore, this location was included in the excavation area and the western property boundary was utilized as the western edge of the extent of excavation.

The extent of the excavation can be determined in the field as the western property boundary will serve as the western extent of excavation and the clean soil bore locations detailed above were marked in the field to serve as the extent of excavation in other directions.

Side-wall samples will be collected according to methods and procedures outlined in Section 2.6.2 of the BUSTR Technical Guidance Manual (TGM) dated September 1, 2017. An estimated area of 80'(L) x 60'(W) x 30'(D) is planned to be excavated during soil remediation activities. The total calculated sidewall area for the excavation is approximately 8,400 ft<sup>2</sup>. Therefore, a total of 84 sidewall samples are estimated to be collected for screening purposes. Sidewall samples will be biased towards areas with highest contamination and screened with a Photoionization Detector (PID) that is calibrated daily. The BUSTR TGM states that if an excavation is greater than 400 yd<sup>3</sup>, a minimum of two (2) soil samples per wall will be submitted from screened samples. Therefore, a total of eight (8) soil samples are estimated to be submitted for laboratory analysis from the excavation cavity. No base / bottom samples will be collected for screening or laboratory analysis as soils are being excavated to groundwater. Sidewall soil samples collected for laboratory analysis will be submitted for BUSTR Group 1 and Group 2 analyses. All sampling methods, procedures, and chemical of concern analysis will be performed according to BUSTR Technical Guidance Manual 2017 guidelines. It should be noted that following soil excavation activities, the soils associated with the following samples are expected to be removed from the risk data set:

T1SB1: 26-28'	T1SB12: 24-26'
T1SB1: 24-26	T3-S
T1SB2: 14-16'	PR-7
T1SB2: 26-28'	DR-2
T1SB3: 22-23.5'	PR-3
T1SB6: 16-18'	T2MW11: 22-24'
T1SB6: 24-26'	T2MW11: 30-32'
T1SB7: 24-26'	T2SB1-E: 26-28'
T1SB7: 26-28'	T2SB1-W: 18-20'
T1SB9: 28-30'	T2SB1-W: 32-34'
T1SB10: 26-28'	

Soil will be excavated to groundwater (anticipated depth of 30-34'). Soils within the clean overburden of approximately 0-12' will be stockpiled adjacent to the excavation area to be appropriately sampled and characterized for re-use according to Section 4.3 of the BUSTR Technical Guidance Manual 2017. The estimated volume of overburden soils is approximately 2,200 yd<sup>3</sup>. The BUSTR TGM states that stockpiles greater than 420 yd<sup>3</sup> require 18 samples plus 1 sample per additional 50 yd<sup>3</sup> for screening, and 8 samples plus 1 sample per additional 50 yd<sup>3</sup> for screening, and 8 samples will be collected for screening and a total of 26 samples will be selected for submittal for laboratory analysis of BUSTR Group 1 and Group 2 compounds. If laboratory analytical data for the overburden is below BUSTR re-use Action Levels, overburden soils will be placed back into the excavation cavity. If laboratory analytical data for the overburden is above BUSTR re-use Action Levels, overburden soil wills be disposed at a licensed disposal facility. Soils excavated from areas of known impact, 12' – groundwater (30-

34'), will be stockpiled separately and disposed at a licensed disposal facility. The entirety of the excavated cavity will be backfilled with approved, clean backfill. Clean backfill will be defined by laboratory sampling or other equivalent demonstration.

The location of the impacted soil sample T1SB1 and the anticipated dimensions of the surrounding excavation area are displayed on Figure 2.

With the removal of the soils associated with the samples listed above, it was determined that the new site maximum concentrations are below all BUSTR action levels for residential land use (see Table 2).

During soil excavation activities, several monitoring wells will be destroyed. The monitoring wells T1MW1, T1MW2, T1MW3, and T1MW11 are located within the proposed soil excavation / remediation area and will be destroyed. As these wells are important to demonstrate the efficacy of groundwater remediation, these wells will be replaced as discussed in Section 7.0.

#### 2.3 Proposed Target Levels Following Remedial Activities

No additional modeling for direct contact to soils will be conducted following remediation. Concentrations of chemicals of concern in soil have been compared to current BUSTR Soil Direct Contact Residential target levels. All previous exceedances of these applicable standards are to be removed as part of the soil excavation remediation activities. Therefore, no exceedances of BUSTR Soil Direct Contact Residential target levels should be present at the subject property following remedial activities.

#### 3.0 Soil to Indoor Air Pathway

#### 3.1 Chemicals of Concern

Results of the soil sampling and modeling conducted during the Tier 2 site assessment showed an exceedance of BUSTR Soil to Indoor Air Non-Residential target levels for the compound 1,2,4-Trimethylbenzene in the sample T1SB1: 26-28' with a detection of 211 ppm and a non-residential BUSTR target level of 86.7 ppm. Additionally, the detection limits for the compounds Benzene (<12.8 ppm), 1,2-Dibromoethane (EDB) (<1.9 ppm), and 1,2-Dichloroethane (EDC) (<12.8 ppm) in the sample T1SB1: 26-28' were above the associated non-residential BUSTR soil to indoor aid non-residential target levels of 10.5 ppm, 0.961 ppm, and 6.33 ppm respectively. These exceedances are in the sample T1SB1: 26-28' and will be addressed with the remedial activities outlined in the following sections.

#### **3.2** Remedial Activities to be Implemented

As outlined and described in Section 2.2, impacted soils associated with the sample T1SB1: 26-28' and all other soil samples listed in Section 2.2, will be removed through excavation activities.

#### 3.3 Proposed Target Levels Following Remedial Activities

No additional modeling for the soil to indoor air pathway will be conducted as all exceedances of the BUSTR Soil to Indoor Air Residential target levels are expected to be removed through soil excavation remediation activities.

#### 4.0 Soil to Drinking Water Leaching Pathway

#### 4.1 Chemicals of Concern

Results of soil sampling showed an exceedance of BUSTR Soil to Drinking Water Leaching target levels for the compounds Naphthalene with a detection of 15.6 ppm (target level 0.511 ppm) and 1,2,4-Trimethylbenzene with a detection of 211 ppm (target level 2.37 ppm) both in the sample T1SB1: 26-28'. Additionally, the detection limits for the compounds Benzene (<12.8 ppm), Methyl-tert-butyl-ether (<12.8), 1,2-Dibromoethane (EDB) (<1.9 ppm), and 1,2-Dichloroethane (EDC) (<12.8 ppm) in the sample T1SB1: 26-28' were above the associated non-residential BUSTR soil leaching to drinking water target levels of 0.246 ppm, 1.58 ppm, 0.000982 ppm, and 0.101 ppm respectively. These exceedances are in the sample T1SB1: 26-28'and will be addressed with the remedial activities outlined in the following sections.

#### 4.2 Remedial Activities to be Implemented

As outlined and described in Section 2.2, impacted soils associated with the sample T1SB1: 26-28' and all other soil samples listed in Section 2.2, will be removed through excavation activities.

#### 4.3 Proposed Target Levels Following Remedial Activities

No additional modeling for the soil leaching to drinking water pathway will be conducted as all soil samples containing exceedances of the BUSTR leaching to drinking water target levels are to be excavated and removed from the subject property.

#### 5.0 Groundwater Ingestion Pathway (on-property)

#### 5.1 Chemicals of Concern

Results of the groundwater sampling showed an exceedance of BUSTR Groundwater Ingestion action levels for the compounds Benzene with a detection of 0.47 ppb (action level 0.005 ppb), Ethylbenzene with a detection of 3.0 ppb (action level 0.7 ppb), Naphthalene with a detection of 0.58 ppb (action level 0.0014 ppb) and 1,2,4-Trimethylbenzene with a detection of 3.5 ppb (action level 0.015 ppb). Due to the groundwater classification at the property as drinking water, detections of chemicals of concern must be compared to BUSTR groundwater ingestion action level values. These detections of chemicals of concern exceed the groundwater ingestion value at the source.

#### 5.2 Remedial Activities to be Implemented

*In situ* groundwater remediation is proposed at the subject property. Proposed groundwater remediation activities are outlined in Section 6.2. These groundwater remediation activities are being performed with the target goal of reducing concentrations of chemicals of concern in groundwater to below BUSTR groundwater ingestion levels.

#### 5.3 Proposed Target Levels Following Remedial Activities

With the implementation of groundwater remediation activities, the target goal is reducing concentrations of chemicals of concern in groundwater to below BUSTR groundwater ingestion levels. Therefore, no additional groundwater modeling is planned at this time. However, additional groundwater monitoring activities are planned to track the progress and efficacy of the groundwater remediation. These monitoring activities are outlined in Section 7.0.

#### 6.0 Groundwater Ingestion Pathway (off-property)

#### 6.1 Chemicals of Concern

Results of the groundwater sampling showed an exceedance of BUSTR Groundwater Ingestion action levels for the compounds Benzene with a detection of 0.47 ppb (action level 0.005 ppb), Ethylbenzene with a detection of 3.0 ppb (action level 0.7 ppb), Naphthalene with a detection of 0.58 ppb (action level 0.0014 ppb) and 1,2,4-Trimethylbenzene with a detection of 3.5 ppb (action level 0.015 ppb). Due to the groundwater classification at the property as drinking water, detections of chemicals of concern must be compared to BUSTR groundwater ingestion action level values. These detections of chemicals of concern exceed the groundwater ingestion value at the source. As the chemicals of concern in groundwater show a non-stable trend, the groundwater plume is fluctuating. Therefore, BUSTR-Screen model spreadsheets could not be used to determine off-property impact. Hence, detections of chemicals of concern must be compared to groundwater ingestion values at the Point of Exposure for the groundwater ingestion pathway (off-property).

#### 6.2 Remedial Activities to be Implemented

Groundwater at the subject property is planned to be remediated with the use of *in situ* remediation technologies in the form of Provect-OX<sup>®</sup>. Provect-OX<sup>®</sup> is a dry, pre-mixed powder material that can be easily injected into the subsurface environment in a variety of ways, based on site-specific designs. Application methods include direct mixing, hydraulic fracturing, pneumatic fracturing, and injection of slurries or liquids. Once emplaced, a number of synergistic reactions take place that offer some notable advantages over other persulfate-based oxidation processes. Provect-OX<sup>®</sup> rapidly oxidizes a wide variety of organic constituents of interest (COI) present in impacted soil, sediment, and groundwater (including chlorinated solvents, petroleum hydrocarbons, and pesticides) and provides a long-term, sustained secondary bioremediation to manage residuals and prevent contaminant rebound. This is accomplished by using ferric iron as a

safe and effective means of activating persulfate, which quickly yields sulfate and ferrate radicals for treatment. The process also enhances subsequent utilization of sulfate and iron as terminal electron acceptors for facultative redox reactions to support secondary biodegradation of any residual COIs. Additional details on product specifications are provided in Appendix A.

Planned groundwater remediation activities at the subject property will consist of two (2) distinct phases described below:

- During soil excavation remediation activities, soil will be excavated down to the groundwater interface (depth of 28-30 feet). Therefore, groundwater will be exposed in the area of soil excavation as shown on Figure 2. While the groundwater area is exposed, 12,000 pounds of amendment (Provect-OX<sup>®</sup>) will be applied to the exposed groundwater and blended with the top two (2) feet of the saturated groundwater interface. This blending will be performed with the bucket of the excavator until the amendment is sufficiently mixed with the top two (2) feet of saturated soils. This approach will allow direct interaction between the amendment and impacted groundwater. Through blending, the amendment will interact with approximately the top two (2) to four (4) feet of impacted groundwater. This approach is proposed due to the accessibility of the exposed groundwater and the beneficial aspects of direct interaction of the amendment to the surface groundwater through the blending process.
- 2. Once the blending activities have been completed, the excavated cavity will be backfilled with pre-approved, clean backfill material. Following backfilling activities, additional amendment (Provect-OX<sup>®</sup>) is planned to be injected into the area of impacted groundwater as displayed on the Figure 3. The targeted area will be addressed with a total of fifteen (15) direct push injection points that will be equally spaced within the proposed injection area and 10,500 lbs. of Provect-OX<sup>®</sup>. Each injection point will receive 700 pounds of oxidant split between two vertical intervals. Calculations for required amendment are based on soil oxidant demand (SOD) of 1.5 grams of Provect-OX<sup>®</sup> per kg of soil. Oxidant loading at

25% by weight of injection slurry will require approximately 3,800 gallons of water. Therefore, each vertical injection interval will receive approximately 350 pounds of Provect-OX<sup>®</sup> and 125 gallons of water.

These groundwater remediation activities are being performed with the target goal of reducing concentrations of chemicals of concern in groundwater to below BUSTR groundwater ingestion levels.

#### 6.3 Proposed Target Levels Following Remedial Activities

With the implementation of groundwater remediation activities, the target goal is reducing concentrations of chemicals of concern in groundwater to below BUSTR groundwater ingestion levels. Therefore, no additional groundwater modeling is planned at this time. However, additional groundwater monitoring activities are planned to track the progress and efficacy of the groundwater remediation. These monitoring activities are outlined in Section 7.0.

#### 7.0 Monitoring Plan

Through the soil remediation process, historic monitoring wells displaying exceedances of chemicals of concern (T1MW1, T1MW2, T1MW3, and T1MW11) will be destroyed. In order to provide the appropriate monitoring data following groundwater remediation activities, these wells will be replaced with the designation T1MW1-R with "R" designating replacement. Additional monitoring will be required within replacement wells in order to test the efficacy of the groundwater remediation and ultimately to provide documentation that concentration of chemicals of concern have been returned to below BUSTR groundwater ingestion action levels.

Prior to remediation activities, a sampling event will be conducted that will include the sampling of all monitoring wells on site in order to determine a baseline analytical data. Sampling methods, procedures, and analyses are identical to those outlined below.

It is proposed that following the installation of the four (4) replacement monitoring wells, a period of six (6) months will elapse prior to initial efficacy sample collection in order to allow bioremedial conditions to develop. Following this initial six (6) month time frame, it is proposed that quarterly groundwater monitoring be performed that will include sample collection from the replacement wells listed above. Quarterly groundwater sampling will continue for a total of six (6) quarters in order to verify the effectiveness of groundwater remediation activities or until the termination criteria is met as outlined below.

Additionally, a sampling event will be conducted where a sample will be collected from all nine (9) monitoring wells located at the subject property at the end of the planned quarterly groundwater monitoring program in order to verify that the groundwater contamination plume has not migrated and is still delineated. As outlined in the BUSTR approved Tier 2 Evaluation, the following will apply to future planned groundwater monitoring:

- Detections of chemicals of concern will be compared to BUSTR groundwater ingestion action levels;
- The monitoring well T1MW11-R will replace T1MW11 as the Tier 2 Evaluation Point Of Demonstration (POD) well;
- The monitoring well T1MW3-R will replace T1MW3 as the Tier 2 Evaluation Point Of Exposure (POE) well.
- Geochemical parameters such as dissolved oxygen, oxygen reduction potential, pH, temperature, and conductivity will be recorded onto sampling field logs during all sampling events. Field logs will be included with all BUSTR reporting submittals.
- Detections of chemicals of concern will be compared to BUSTR groundwater ingestion levels and will be required to remain under BUSTR groundwater ingestion levels for a total of two (2) concurrent quarterly sampling events in order to seek termination of groundwater monitoring and No Further Action (NFA) status from BUSTR.

Sampling methods and procedures that will be performed as part of the quarterly groundwater monitoring are outlined below.

# Field Sampling and Analysis Program

The field team conducting the groundwater sampling will adhere to the field sampling and analysis methods and procedures detailed below. Included are specific requirements outlining the procedures to be followed in relation to sample handling, packaging, and shipping. Also, below are guidelines for field documentation procedures.

# Sample Handling, Packaging, and Shipping Requirements

Upon collection, samples will be placed into their appropriate sample containers. The exterior of the sample containers will be wiped clean and affixed with the proper labeling. Samples collected at the site will be uniquely labeled with an alphanumeric

sample identifier. Sample label information will be completed using waterproof black ink. The labels will contain such information as:

- Sample identification based on the sampling location;
- Time and date of collection; and,
- Parameters to be analyzed;

Groundwater samples will contain the date of sample collection and the sample number for the specific well number.

The samples will be packaged and sealed in a cooler and shipped to the lab. Chain of custody documentation will accompany each group of samples submitted to the lab.

# Field Documentation Procedures

The field team will be required to maintain field logs. The field logs will be used to collect information on site conditions, personnel at the site, and other pertinent information. Drilling and well installation, development and sampling information will be recorded on log forms.

# Well Installation Methodology

A GeoProbe model 7822DT or equivalent rig will be utilized to install the replacement groundwater monitoring wells. The wells will be advanced using eight-inch hollow stem augers via a hydraulic rotary head on the rig. All wells will be advanced to a total depth identical to the depth of the original well. The monitoring wells will be constructed of two-inch inside diameter PVC Schedule 40 riser pipe with jointed threading and ten feet of 0.010-inch factory slotted PVC Schedule 40 screen and end cap. The annular space around the PVC pipe will be filled with sand from total depth to two feet above the screen, and the remaining annular space will be backfilled with hydrated sodium bentonite chips. All wells will be logged for their lithology as they progressed.

## Groundwater Sampling Methodology

Groundwater samples will be collected using a bladder pump and low flow sampling techniques. The groundwater samples will be placed in an iced cooler for transport to the lab. Groundwater samples will be analyzed for BUSTR Group 1 and Group 2 analyses that include the following:

- BTEX (Benzene, Toluene, Ethylbenzene, Xylenes / method 8260)
- MTBE (methyl tert-butyl ether / method 8260)
- Naphthalene (method 8260)
- 1,2,4-Trimethylbenzene (method 8260)
- 1,2-Dibromoethane (EDB / method 8260)
- 1,2-Dichloroethane (EDC / method 8260)
- Benzo(a)anthracene (Method 8270)
- Benzo(a)pyrene (Method 8270)
- Benzo(b)fluoranthene (Method 8270)
- Benzo(k)fluoranthene (Method 8270)
- Chrysene (Method 8270)
- Dibenz(a,h)anthracene (Method 8270)
- Indeno(1,2,3-c,d)pyrene (Method 8270)
- Naphthalene (Method 8270)

Reporting on the quarterly monitoring events and completion reporting are outlined in Section 8.0.

#### 8.0 **Reporting Frequency**

A Remedial Action Plan Certification Report will be prepared following the completion of initial soil and groundwater remediation activities and submitted to BUSTR. The certification report will contain a full description of soil excavation activities that includes confirmatory soil sampling results, groundwater remediation activities that includes all injection activities, and replacement monitoring well installation details.

Additionally, BUSTR will receive a quarterly groundwater monitoring report, outlining the findings and conclusions of each quarterly monitoring event. If quarterly sampling reaches the end of the projected six (6) quarterly sampling events and the remedial objectives have not been met, one of the following will occur:

- Monitoring activities will continue and concentration trends will be analyzed;
- An Interim Response Action (IRA) will be conducted;
- An additional Remedial Action Plan (RAP) will be developed.

If the objectives of the monitoring plan have been met, then the owner / operator will submit a completion report within 90 days after receiving analytical results of the last sampling event. The completion report will demonstrate that the remedial action objectives have been met and a request for No Further Action (NFA) will be made.

#### 9.0 Remedial Action Alternatives Considered

The following remedial action alternatives were considered for the subject property:

#### <u>Soil:</u>

It was first considered that several use restrictions be placed at the subject property that included a "non-residential" land use restriction in addition to a "prohibition against basements" to be applied to the subject property along with site-specific modeling with specialized sample collection to substitute for certain BUSTR spreadsheet modeling parameters. It was determined that this approach would complicate the no further action process and expend unnecessary amounts of project time and costs in sample collection, field team mobilization, BUSTR spreadsheet modeling, and seeking BUSTR approval. Therefore, it was concluded that impacted sample removal through soil excavation was the most cost and time effective form of soil remediation.

#### Groundwater:

Various groundwater remediation techniques were considered during remedial action planning. Several *in situ* bioremediation manufacturers were researched in order to determine the most cost effective and productive form of groundwater remediation. For example, the remediation product EOSpro was considered for the subject property. The EOSpro product utilizes enriched emulsified vegetable oil to stimulate anaerobic bioremediation with the introduction of BAC-9 enriched bioaugmentation culture capable of degrading chlorinated solvents and other recalcitrant chemicals in contaminated groundwater. It was determined that although this product is specifically designed for chlorinated solvents like trichloroethene and may effectively remediate some of the impact of some volatile organic compounds, it would not remediate specific chemicals of concern at the subject property, i.e. additional volatile organic compounds, total petroleum hydrocarbons, and polynuclear aromatics. Furthermore, this product requires a significant period of time for fermentation to take place in order to provide legitimate results to test efficacy.
Also, a secondary remediation product 3-D MicroEmulsion (3-DME) was considered for the subject property. This product is comprised of free lactic acid, controlled-release lactic acid (polylactate), and certain fatty acid components which are esterified to a carbon backbone molecule of glycerin. The 3-DME product provides a low-cost solution for reductive dichlorination. However, as with the EOSpro and BAC-9 product, this product is specifically designed for chlorinated solvents like trichloroethene and may not effectively remediate specific chemicals of concern at the subject property, i.e. additional volatile organic compounds, total petroleum hydrocarbons, and polynuclear aromatics.

It was concluded, based on previous project experience and through documentation, that the use of the Provect-OX<sup>®</sup> product, manufactured by Provectus, would be most beneficial. A similar product provided by Provectus was utilized at another PANDEY project site to provide groundwater remediation to a contaminated groundwater plume. The project was met with successful reduction of the desired chemicals of concern at a reasonable cost. Provectus was provided site specific details that included subsurface geology, depth to groundwater, plume area, and type and concentration of chemicals of concern. Provectus recommended the product Provect-OX<sup>®</sup> for groundwater remediation. The product Provect-OX<sup>®</sup> rapidly oxidizes a wide variety of organic chemicals present in impacted soil, sediment, and groundwater (including chlorinated solvents, petroleum hydrocarbons, and pesticides) and provides long term, sustained secondary bioremediation to manage residuals and prevent contaminant rebound. Two (2) separate distribution methods of the Provect-OX<sup>®</sup> product were considered during the planning process: 1) direct contact of the product through mixing with either the excavator bucket or rotary tool specifically designed for soil blending, or 2) injection treatment through direct push technology where where a casing or hollow rod is inserted into the contaminated area. Treatment chemicals and water are injected under pressure to insure full contact and saturation with the soils. It was concluded that a combination of these methods would be implemented. Soil excavation activities at the subject property would create an area of exposed material at the groundwater interface. It was decided that while this area is exposed, the Provect-OX<sup>®</sup> product will be added for direct contact blending for immediate impact. Then, following backfill activities, additional Provect-OX®

product would be introduced through direct push injection in order to provide added remedial benefit.

The manufacturer, Provectus, provided a case study of the Provect-OX<sup>®</sup> product applied to a similar gas station property to document the success of the product in comparable situations. In this documentation, it can be seen that a significant reduction (approximately 70%-90%) was observed in similar contaminants of concern. This documentation is provided in Appendix A for reference.

#### **10.0 Report Limitations**

The conclusions and recommendations presented in this report are based on the level of effort and investigative techniques defined under the scope of work necessary to prepare a remedial action plan. This remedial action plan is not a design document and should not be construed as such. This plan presents a conceptual layout of the proposed remedy only. PANDEY has conducted this investigation in a manner consistent with sound engineering practices and with professional judgment. This report does not attempt to evaluate past or present compliance with federal, state, and local environmental or land use laws and regulations except to the extent the compliance relates to releases of hazardous substances and/or petroleum and to the factors which may affect the eligibility of the property under the BUSTR NFA process. PANDEY makes no guarantees regarding the completeness or accuracy of any information obtained in review of public or private files.

# FIGURES

Figure 1: Property Location Map

Figure 2: Soil Sample Map and Proposed Soil Remediation Area

Figure 3: Proposed Groundwater Remediation Area



12/16/2021





# TABLES

 Table 1a-e: Soil Concentrations Compared to BUSTR Action Levels (with samples removed due to excavation)

Table 2: New Site-wide Soil Maximum Concentrations Compared to BUSTR Action Levels

Table 1a Soil Concentrations Compared to BUSTR Action Levels

						Tier 1	L Source Inv	estigation S	oil Bores														
Sample ID	T1SB1	T1SB1	T1SB2	T1SB2	T1SB3	T1SB3	T1SB4	T1SB4	T1SB5	T1SB5	T1SB6	T1SB6	T1SB7	T1SB7				Soil Direct	Soil to		Soil to		Soil to
Depth	26-28'	24-26'	14-16'	26-28'	2-4'	22-23.5'	20-22'	26-28'	2-4'	26-26'	16-18'	24-26'	24-26'	26-28'	BUSTR	Soil Direct	Soil Direct	Contact -	Drinking	Soil to	Indoor	Soil to	Outdoor
							-								Delineation	Contact -	Contact - Non-	Excavation	Water	Indoor	Air (Non-	Outdoor	Air (non-
Sampling Date							9/1	6/2020							Action Level	Residential	Residential	Worker	Leaching	Air (Res)	Res)	Air (Res)	res)
Volatile Organic Compounds (V	OCs)																						
Benzene	<12.8	<0.0057	<0.69	<0.0054	<0.0053	<0.0052	<0.0055	<0.0061	<0.0059	<0.0061	0.0081	<0.0062	<0.0055	0.085	1.67	26	140	1200	0.246	1.67	10.5	52.7	33.2
Ethylbenzene	34.7	<0.0057	2.9	0.0059	<0.0053	<0.0052	<0.0055	<0.0061	<0.0059	<0.0061	<0.0053	<0.0062	<0.0055	0.57	406	130	480	480	84.5	406	6590	12800	20900
Methyl-tert-butyl ether	<12.8	<0.0057	<0.69	<0.0054	<0.0053	<0.0052	<0.0055	<0.0061	<0.0059	<0.0061	<0.0053	<0.0062	<0.0055	<0.0055	150	1100	5700	8900	1.58	150	940	4740	2990
Toluene	<12.8	<0.0057	<0.69	<0.0054	<0.0053	<0.0052	<0.0055	<0.0061	<0.0059	<0.0061	<0.0053	<0.0062	<0.0055	0.025	1,240	820	820	820	70.7	1240	20200	39200	64000
Xylene (Total)	<25.5	<0.011	4.2	0.023	<0.011	<0.010	<0.011	<0.012	<0.012	<0.012	<0.011	<0.012	<0.011	0.57	42.7	260	260	260	1030	42.7	693	1350	2200
Naphthalene	15.6	<0.0057	6.3	0.014	<0.0053	<0.0052	<0.0055	<0.0061	<0.0059	<0.0061	<0.0053	<0.0062	<0.0055	0.046	52.7	90	450	560	0.511	52.7	330	1670	1050
1,2,4-Trimethylbenzene	211	<0.0057	35.6	0.031	<0.0053	<0.0052	<0.0055	<0.0061	<0.0059	< 0.0061	<0.0053	<0.0062	<0.0055	0.81	5.35	160	220	220	2.34	5.35	86.7	169	275
1,2-Dibromoethane (EDB)	<1.9	<0.00085	<0.10	<0.0054	<0.00080	<0.00078	<0.00082	<0.00092	<0.00088	<0.00092	<0.00079	<0.00092	<0.00083	<0.00082	0.154	0.83	4.4	38	0.000982	0.154	0.961	4.86	3.06
1,2-Dichloroethane (EDC)	<12.8	<0.0057	<0.69	<0.00081	<0.0053	<0.0052	<0.0055	0.013	<0.0059	< 0.0061	<0.0053	<0.0062	<0.0055	<0.0055	1.01	11	56	480	0.101	1.01	6.33	31.9	20.1
Polynuclear Aromatics																							
Benzo(a)anthracene	<0.0063	0.0061	<0.0062	<0.0052	0.023	<0.0047	<0.0053	<0.0056	0.84	<0.0058	<0.0050	<0.0058	<0.0051	<0.0050	12	12	58	1200	38.1	72800	456000	>1E+6	>1E+6
Benzo(a)pyrene	<0.0063	0.0054	<0.0062	<0.0052	0.025	<0.0047	<0.0053	<0.0056	0.83	<0.0058	<0.0050	<0.0058	<0.0051	<0.0050	1.2	1.2	5.8	120	29.2	213000	>1E+6	>1E+6	>1E+6
Benzo(b)fluoranthene	<0.0063	0.0087	<0.0062	0.006	0.03	<0.0047	<0.0053	<0.0056	0.95	<0.0058	0.0051	<0.0058	<0.0051	<0.0050	12	12	58	1200	136	>1E+6	>1E+6	>1E+6	>1E+6
Benzo(k)fluoranthene	<0.0063	<0.0050	<0.0062	<0.0052	0.011	<0.0047	<0.0053	<0.0056	0.33	<0.0058	<0.0050	<0.0058	<0.0051	<0.0050	120	120	580	12000	1270	>1E+6	>1E+6	>1E+6	>1E+6
Chrysene	<0.0063	0.0089	<0.0062	<0.0052	0.022	<0.0047	<0.0053	<0.0056	0.75	<0.0058	<0.0050	<0.0058	<0.0051	<0.0050	1,200	1200	5800	120000	3870	>1E+6	>1E+6	>1E+6	>1E+6
Dibenz(a,h)anthracene	<0.0063	<0.0050	<0.0062	<0.0052	0.0053	<0.0047	<0.0053	<0.0056	0.15	<0.0058	<0.0050	<0.0058	<0.0051	<0.0050	1.2	1.2	5.8	120	46.6	853000	>1E+6	>1E+6	>1E+6
Ideno(1,2,3-cd)pyrene	<0.0063	<0.0050	<0.0062	<0.0052	0.014	<0.0047	<0.0053	<0.0056	0.39	<0.0058	<0.0050	<0.0058	<0.0051	<0.0050	12	12	58	1200	1020	>1E+6	>1E+6	>1E+6	>1E+6
Naphthalene	1.8	0.26	<0.0062	0.19	0.01	<0.0047	0.028	0.011	0.1	0.0067	<0.0050	0.035	0.52	0.066	52.7	90	450	560	0.511	52.7	330	1670	1050
Total Petroleum Hydrocarbons	(TPHs)																						
ТРН (СОб-С12)	4,340	<1.1	1,000	<1.1	<1.1	<1.0	<1.1	<1.2	<1.2	<1.2	<1.1	<1.2	3.1	<1.1	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
TPH (C10-C20)	453	<11.3	342	<10.8	<9.8	<10.3	<10.9	<11.8	<11.3	<10.9	<9.9	<10.9	<11.0	24	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
TPH (C20-C34)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000

All results in mg/kg.

Yellow shading denotes sample removed during soil excavation remediation.

Blue shading denotes detection of analyte.

Table 1b Soil Concentrations Compared to BUSTR Action Levels

							Ti	er 1 Delinea	tion Soil Bo	res															
Sample ID	T1SB8	T1SB8	T1SB9	T1SB9	T1SB10	T1SB10	T1SB11	T1SB11	T1SB12	T1SB12	T1SB13	T1SB13	T1SB14	T1SB14	T1SB15	T1SB15			Soil Direct	Soil Direct	Soil to		Soil to		Soil to
Depth	24-26'	26-28'	28-30'	36-38'	2-4'	26-28'	22-24'	26-28'	0-2'	24-26'	28-30'	34-36'	16-18'	34-36'	8-10'	28-30'	BUSTR	Soil Direct	Contact -	Contact -	Drinking	Soil to	Indoor	Soil to	Outdoor
																	Delineation	Contact -	Non-	Excavation	Water	Indoor	Air (Non-	Outdoor	Air (non-
Sampling Date								12/28	3/2020								Action Level	Residential	Residential	Worker	Leaching	Air (Res)	Res)	Air (Res)	res)
Volatile Organic Compounds	s (VOCs)																								
Benzene	<0.0059	<0.0052	0.043	<0.0056	<0.0058	<0.0060	<0.0053	<0.0064	<0.0054	<0.0053	<0.0051	<0.0058	<0.0059	<0.0056	<0.0059	< 0.0063	1.67	26	140	1200	0.246	1.67	10.5	52.7	33.2
Ethylbenzene	<0.0059	<0.0052	<0.0054	<0.0056	<0.0058	<0.0060	<0.0053	<0.0064	<0.0054	<0.0053	<0.0051	<0.0058	<0.0059	<0.0056	<0.0059	<0.0063	406	130	480	480	84.5	406	6590	12800	20900
Methyl-tert-butyl ether	<0.0059	<0.0052	<0.0054	<0.0056	<0.0058	<0.0060	<0.0053	<0.0064	<0.0054	<0.0053	<0.0051	<0.0058	<0.0059	<0.0056	<0.0059	<0.0063	150	1100	5700	8900	1.58	150	940	4740	2990
Toluene	<0.0059	<0.0052	0.0088	<0.0056	<0.0058	<0.0060	<0.0053	<0.0064	<0.0054	<0.0053	<0.0051	<0.0058	<0.0059	<0.0056	<0.0059	< 0.0063	1,240	820	820	820	70.7	1240	20200	39200	64000
Xylene (Total)	<0.012	<0.01	<0.011	<0.011	<0.012	<0.012	<0.011	<0.013	<0.011	<0.011	<0.010	<0.012	<0.012	<0.011	<0.012	<0.013	42.7	260	260	260	1030	42.7	693	1350	2200
Naphthalene	<0.0059	<0.0052	<0.0054	<0.0056	<0.0058	<0.0060	<0.0053	<0.0064	<0.0054	<0.0053	<0.0051	<0.0058	<0.0059	<0.0056	<0.0059	< 0.0063	52.7	90	450	560	0.511	52.7	330	1670	1050
1,2,4-Trimethylbenzene	<0.0059	<0.0052	<0.0054	<0.0056	<0.0058	<0.0060	<0.0053	<0.0064	<0.0054	<0.0053	<0.0051	<0.0058	<0.0059	<0.0056	<0.0059	< 0.0063	5.35	160	220	220	2.34	5.35	86.7	169	275
1,2-Dibromoethane (EDB)	<0.00088	<0.00079	<0.00081	<0.00085	<0.00088	<0.00090	<0.0008	<0.00096	<0.00081	<0.00080	<0.00077	<0.00087	<0.00089	<0.00084	<0.00089	<0.00094	0.154	0.83	4.4	38	0.000982	0.154	0.961	4.86	3.06
1,2-Dichloroethane (EDC)	<0.0059	<0.0052	0.011	<0.0056	<0.0058	<0.0060	<0.0053	< 0.0064	<0.0054	<0.0053	<0.0051	<0.0058	<0.0059	<0.0056	<0.0059	< 0.0063	1.01	11	56	480	0.101	1.01	6.33	31.9	20.1
Polynuclear Aromatics																									
Benzo(a)anthracene	<0.0058	<0.0052	<0.0053	0.011	0.019	<0.0059	<0.0052	< 0.0063	0.029	<0.0053	0.014	0.0077	<0.0058	0.0075	<0.0059	0.01	12	12	58	1200	38.1	72800	456000	>1E+6	>1E+6
Benzo(a)pyrene	<0.0058	<0.0052	<0.0053	0.015	0.016	<0.0059	<0.0052	0.007	0.3	<0.0053	0.012	0.012	<0.0058	0.0098	<0.0059	0.014	1.2	1.2	5.8	120	29.2	213000	>1E+6	>1E+6	>1E+6
Benzo(b)fluoranthene	<0.0058	<0.0052	0.014	0.2	0.022	0.0083	0.0061	0.011	0.4	0.0053	0.023	0.016	<0.0058	0.014	<0.0059	0.02	12	12	58	1200	136	>1E+6	>1E+6	>1E+6	>1E+6
Benzo(k)fluoranthene	<0.0058	<0.0052	<0.0053	<0.0055	0.011	<0.0059	<0.0052	< 0.0063	0.019	<0.0053	0.0077	<0.0058	<0.0058	<0.0056	<0.0059	<0.0062	120	120	580	12000	1270	>1E+6	>1E+6	>1E+6	>1E+6
Chrysene	<0.0058	<0.0052	0.017	0.02	0.02	0.0085	0.0071	0.011	0.033	<0.0053	0.019	0.016	<0.0058	0.013	<0.0059	0.02	1,200	1200	5800	120000	3870	>1E+6	>1E+6	>1E+6	>1E+6
Dibenz(a,h)anthracene	<0.0058	<0.0052	<0.0053	0.0062	<0.0058	<0.0059	<0.0052	< 0.0063	0.0069	<0.0053	<0.0050	<0.0058	<0.0058	<0.0056	<0.0059	<0.0062	1.2	1.2	5.8	120	46.6	853000	>1E+6	>1E+6	>1E+6
Ideno(1,2,3-cd)pyrene	<0.0058	<0.0052	0.0066	0.012	0.0099	<0.0059	<0.0052	0.0067	0.019	<0.0053	0.014	0.0076	<0.0058	0.0071	<0.0059	0.0099	12	12	58	1200	1020	>1E+6	>1E+6	>1E+6	>1E+6
Naphthalene	<0.0058	<0.0052	0.065	0.038	0.059	0.036	0.007	0.011	0.0055	0.052	0.03	0.057	<0.0058	0.036	<0.0059	0.066	52.7	90	450	560	0.511	52.7	330	1670	1050
Total Petroleum Hydrocarbo	ons (TPHs)													-	-			-							
TPH (C06-C12)	<1.2	<1	<1.1	<1.1	<1.2	<1.2	<1.1	<1.3	<1.1	<1.1	<1.0	<1.2	<1.2	<1.1	<1.2	<1.3	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
TPH (C10-C20)	<11.5	<10.3	13.2	<11.1	<11.5	<11.8	<10.6	<12.7	<53	<10.4	11.4	<11.5	<11.8	<11.3	<11.7	<12.3	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
TPH (C20-C34)	<11.5	<10.3	18.2	<11.1	<11.5	<11.8	<10.6	<12.7	<53	<10.4	14.8	<11.5	<11.8	<11.3	<11.7	<12.3	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000

All results in mg/kg.

Yellow shading denotes sample removed during soil excavation remediation.

Blue shading denotes detection of analyte.

#### Table 1c Soil Concentrations Compared to BUSTR Action Levels

	Addition	nal Tier 1 De	elineation So	oil Bores	Tie	er II Delinea	tion Soil Bo	res					<b>C</b> , 11, 1		<b>C</b> , 11, 1		<b>C</b> , 11, 1
Sample ID	T1MW7	T1MW7	T1MW8	T1MW8	T2SB4	T2SB4	T2SB3	T2SB3	RUCTD	Soil Direct	Soil Direct	Soil Direct	Soil to Drinking	Soil to	Soil to	Soil to	Soil to
Depth	20-22'	34-36'	28-30'	34-36'	22-24'	24-26'	14-16'	26-28'	Delineation	Contact -	Contact - Non-	Excavation	Water	Indoor	Air (Non-	Outdoor	Air (non-
Sampling Date		3/2/	2021			9/22	/2021		Action Level	Residential	Residential	Worker	Leaching	Air (Res)	Res)	Air (Res)	res)
Volatile Organic Compounds (VOC	(s)							•		•			•	•	•	•	
Benzene	<0.0051	<0.0055	<0.0052	<0.0058	<0.0068	<0.0053	<0.0056	<0.0063	1.67	26	140	1200	0.246	1.67	10.5	52.7	33.2
Ethylbenzene	<0.0051	<0.0055	<0.0052	<0.0058	<0.0068	<0.0053	<0.0056	<0.0063	406	130	480	480	84.5	406	6590	12800	20900
Methyl-tert-butyl ether	<0.0051	<0.0055	<0.0052	<0.0058	<0.0068	<0.0053	<0.0056	< 0.0063	150	1100	5700	8900	1.58	150	940	4740	2990
Toluene	<0.0051	<0.0055	<0.0052	<0.0058	<0.0068	<0.0053	<0.0056	< 0.0063	1,240	820	820	820	70.7	1240	20200	39200	64000
Xylene (Total)	< 0.01	<0.011	<0.01	<0.012	<0.014	<0.011	<0.011	<0.013	42.7	260	260	260	1030	42.7	693	1350	2200
Naphthalene	<0.0051	<0.0055	<0.0052	<0.0058	<0.0068	<0.0053	<0.0056	<0.0063	52.7	90	450	560	0.511	52.7	330	1670	1050
1,2,4-Trimethylbenzene	<0.0051	<0.0055	<0.0052	<0.0058	<0.0068	<0.0053	<0.0056	<0.0063	5.35	160	220	220	2.34	5.35	86.7	169	275
1,2-Dibromoethane (EDB)	<0.00077	<0.00083	<0.00078	<0.00087	<0.00080	< 0.00063	<0.00066	<0.00075	0.154	0.83	4.4	38	0.000982	0.154	0.961	4.86	3.06
1,2-Dichloroethane (EDC)	<0.0051	<0.0055	<0.0052	<0.0058	<0.0068	<0.0053	<0.0056	<0.0063	1.01	11	56	480	0.101	1.01	6.33	31.9	20.1
Polynuclear Aromatics	-	-								•				-		-	
Benzo(a)anthracene	<0.0049	0.0055	0.0075	<0.0056	<0.14	<0.11	<0.11	<0.13	12	12	58	1200	38.1	72800	456000	>1E+6	>1E+6
Benzo(a)pyrene	<0.0049	0.0062	0.008	<0.0056	<0.14	<0.11	<0.11	<0.13	1.2	1.2	5.8	120	29.2	213000	>1E+6	>1E+6	>1E+6
Benzo(b)fluoranthene	<0.0049	0.0081	0.011	<0.0056	<0.27	<0.21	<0.22	<0.25	12	12	58	1200	136	>1E+6	>1E+6	>1E+6	>1E+6
Benzo(k)fluoranthene	<0.0049	<0.0053	<0.0050	<0.0056	<0.27	<0.21	<0.22	<0.25	120	120	580	12000	1270	>1E+6	>1E+6	>1E+6	>1E+6
Chrysene	<0.0049	0.0084	0.013	<0.0056	<0.27	<0.21	<0.22	<.25	1,200	1200	5800	120000	3870	>1E+6	>1E+6	>1E+6	>1E+6
Dibenz(a,h)anthracene	<0.0049	<0.0053	<0.0050	<0.0056	<0.14	<0.11	<0.11	<0.13	1.2	1.2	5.8	120	46.6	853000	>1E+6	>1E+6	>1E+6
Indeno(1,2,3-cd)pyrene	<0.0049	<0.0053	0.005	<0.0056	<0.14	<0.11	<0.11	<0.13	12	12	58	1200	1020	>1E+6	>1E+6	>1E+6	>1E+6
Naphthalene	<0.0049	0.017	0.074	0.0071	<0.27	<0.21	<0.22	<0.25	52.7	90	450	560	0.511	52.7	330	1670	1050
Total Petroleum Hydrocarbons (TF	PHs)																
TPH (C06-C12)	<1	<1.1	<1	<1.2	<2.7	<2.1	<2.2	<2.5	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
ТРН (С10-С20)	<10.1	<11	<10.1	<11.3	<20	<16	<17	<19	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
TPH (C20-C34)	<10.1	<11	12.4	<11.3	78.0	42.0	36.0	<19	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000

All results in mg/kg.

Yellow shading denotes sample removed during soil excavation remediation.

Blue shading denotes detection of analyte.

Table 1d Soil Concentrations Compared to BUSTR Action Levels

				BUSTR	Closure Ass	essment Sa	mpling												
Sample ID														Soil Direct	Soil to				
	T3-S	EW-1	DP-3	DP-4	DD-1	PR-7	DR-2	PR-14	PR-13	PR-3	BUSTR	Soil Direct	Soil Direct	Contact -	Drinking		Soil to	Soil to	
											Delineation	Contact -	Contact - Non-	Excavation	Water	Soil to Indoor	Indoor Air	Outdoor Air	Soil to Outdoor
Sampling Date					7/9/2	2020					Action Level	Residential	Residential	Worker	Leaching	Air (Res)	(Non-Res)	(Res)	Air (non-res)
Volatile Organic Compounds (VOC	s)	_	-	-		-	-		-				-		-		-	_	-
Benzene	<0.0061	<0.006	<0.0053	<0.0051	<0.0057	<0.0058	<0.006	<0.0053	<0.0062	<0.0056	1.67	26	140	1200	0.246	1.67	10.5	52.7	33.2
Toluene	<0.0061	<0.006	<0.0053	<0.0051	0.032	<0.0058	<0.006	<0.0053	<0.0062	<0.0056	1,240	820	820	820	70.7	1240	20200	39200	64000
Ethylbenzene	0.051	<0.006	<0.0053	<0.0051	0.031	<0.0058	<0.006	<0.0053	<0.0062	<0.0056	406	130	480	480	84.5	406	6590	12800	20900
Total Xylenes	0.065	<0.012	<0.011	<0.010	0.19	<0.012	<0.012	<0.011	<0.012	<0.0056	42.7	260	260	260	1030	42.7	693	1350	2200
Naphthalene	5.3	<0.006	<0.210	<0.0051	0.061	0.42	<0.006	<0.0053	<0.0062	<0.0056	52.7	90	450	560	0.511	52.7	330	1670	1050
1,2,4 Trimethyl Benzene	39	<0.006	<0.0053	<0.0051	0.23	<0.0058	<0.006	<0.0053	<0.0062	<0.0056	5.35	160	220	220	2.37	5.35	86.7	169	275
MTBE	<0.0061	<0.006	<0.0053	<0.0051	<0.0057	<0.0058	<0.006	<0.0053	<0.0062	<0.0056	150	1100	5700	8900	1.58	150	940	4740	2990
1,2 - Dibromoethane (EDB)	<0.00072	<0.00071	< 0.00062	< 0.00061	<0.00067	<0.00068	<0.0007	<0.00062	<0.00073	<0.00067	0.154	0.83	4.4	38	0.000982	0.154	0.961	4.86	3.06
1,2 - Dichloroethane (EDC)	<0.0061	<0.006	<0.0053	<0.0051	<0.0057	<0.0058	<0.006	<0.0053	<0.0062	<0.0056	1.01	11	56	480	0.101	1.01	6.33	31.9	20.1
Polynuclear Aromatics (PAHs)		_	-				-		-						-		-		-
Benzo (a) Anthracene	<0.120	<0.120	<0.100	<0.100	<0.110	<0.120	<0.120	<0.110	<0.120	4.5	12	12	58	1200	38.1	72800	456000	>1E+6	>1E+6
Benzo (a) Pyrene	<0.240	<0.240	<0.210	<0.210	<0.230	<0.230	<0.240	<0.210	<0.250	5.2	1.2	1.2	5.8	120	29.2	213000	>1E+6	>1E+6	>1E+6
Benzo (b) Fluoranthene	<0.240	<0.240	<0.210	<0.210	<0.230	<0.230	<0.240	<0.210	<0.250	5.5	12	12	58	1200	136	>1E+6	>1E+6	>1E+6	>1E+6
Benzo (k) Fluoranthene	<0.240	<0.240	<0.210	<0.210	<0.230	<0.230	<0.240	<0.210	<0.250	2.1	120	120	580	12000	1270	>1E+6	>1E+6	>1E+6	>1E+6
Chrysene	<0.240	<0.240	<0.210	<0.210	<0.230	<0.230	<0.240	<0.210	<0.250	4.8	1,200	1200	5800	120000	3870	>1E+6	>1E+6	>1E+6	>1E+6
Dibenz (a,h) Anthracene	<0.240	<0.240	<0.210	<0.210	<0.230	<0.230	<0.240	<0.210	<0.250	0.59	1.2	1.2	5.8	120	46.6	853000	>1E+6	>1E+6	>1E+6
Indeno (1,2,3-cd) Pyrene	<0.120	<0.120	<0.100	<0.100	<0.110	<0.120	<0.120	<0.110	<0.120	2.7	12	12	58	1200	1020	>1E+6	>1E+6	>1E+6	>1E+6
Naphthalene	<0.240	<0.240	<0.210	<0.210	<0.230	<0.230	<0.240	<0.210	<0.250	<0.230	52.7	90	450	560	0.511	52.7	330	1670	1050
Total Petroleum Hydrocarbons (TP	PH)	-			-	-	-	-	-	-	-	-		-	-		-	-	
ТРН (С6-С12)	1,500	<2.4	<2.1	<2.1	210	<2.3	<2.4	<2.1	<2.5	<2.3	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
ТРН (С10-С20)	760	<18	<16	<15	1,700	23	<18	28	<19	<17	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
TPH (C20-C34)	41	<18	19	23	200	21	24	28	21	37	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000

All results in mg/kg.

Yellow shading denotes sample removed during soil excavation remediation.

Blue shading denotes detection of analyte.

Table 1e Soil Concentrations Compared to BUSTR Action Levels

				TIER 2 Co	omment Res	ponse Soil	Sampling												
Sample ID	T2MW11	T2MW11	T2SB1-S	T2SB1-S	T2SB1-E	T2SB1-E	T2SB1-N	T2SB1-N	T2SB1-W	T2SB1-W	BUSTR	Soil Direct	Soil Direct	Soil Direct Contact -	Soil to Drinking	Soil to	Soil to	Soil to	
Depth	22-24'	30-32'	22-24'	26-28'	10-12'	26-28'	22-24"	26-28'	18-20'	32-34'	Delineation	Contact -	Contact - Non-	Excavation	Water	Indoor Air	Indoor Air	Outdoor Air	Soil to Outdoor
Sampling Date					7/9/	2020					Action Level	Residential	Residential	Worker	Leaching	(Res)	(Non-Res)	(Res)	Air (non-res)
Volatile Organic Compounds (VOC	s)	_		_	_	-	-		-	-		-							
Benzene	<0.0057	0.27	<0.0058	<0.0060	<0.0058	<0.0058	<0.0054	<0.0054	<0.0054	<0.0057	1.67	26	140	1200	0.246	1.67	10.5	52.7	33.2
Toluene	<0.0057	<0.0057	<0.0058	<0.0060	<0.0058	<0.0058	<0.0054	<0.0054	<0.0054	<0.0057	1,240	820	820	820	70.7	1240	20200	39200	64000
Ethylbenzene	<0.0057	<0.0057	<0.0058	<0.0060	<0.0058	4.5	<0.0054	<0.0054	<0.0054	<0.0057	406	130	480	480	84.5	406	6590	12800	20900
Total Xylenes	<0.011	<0.011	<0.012	<0.012	<0.012	7.5	<0.011	<0.011	0.016	<0.011	42.7	260	260	260	1030	42.7	693	1350	2200
Naphthalene	<0.0057	<0.0057	<0.0058	<0.0060	0.011	7.2	<0.0054	<0.0054	<0.0054	<0.0057	52.7	90	450	560	0.511	52.7	330	1670	1050
1,2,4 Trimethyl Benzene	<0.0057	<0.0057	<0.0058	<0.0060	0.0096	54	<0.0054	<0.0054	0.0089	<0.0057	5.35	160	220	220	2.37	5.35	86.7	169	275
MTBE	<0.0057	<0.0057	<0.0058	<0.0060	<0.0058	<0.0058	<0.0054	<0.0054	<0.0054	<0.0057	150	1100	5700	8900	1.58	150	940	4740	2990
1,2 - Dibromoethane (EDB)	<0.00064	<0.00064	<0.00065	<0.00067	<0.00065	<0.00068	<0.00060	<0.00061	<0.00060	<0.00064	0.154	0.83	4.4	38	0.000982	0.154	0.961	4.86	3.06
1,2 - Dichloroethane (EDC)	<0.0057	0.012	<0.0058	<0.0060	<0.0058	<0.0058	<0.0054	<0.0054	<0.0054	<0.0057	1.01	11	56	480	0.101	1.01	6.33	31.9	20.1
Polynuclear Aromatics (PAHs)																			
Benzo (a) Anthracene	<0.110	<0.110	<0.120	<0.120	<0.120	<0.120	<0.110	<0.110	<0.110	<0.110	12	12	58	1200	38.1	72800	456000	>1E+6	>1E+6
Benzo (a) Pyrene	<0.230	<0.230	<0.230	<0.240	<0.230	<0.230	<0.220	<0.220	<0.210	<0.230	1.2	1.2	5.8	120	29.2	213000	>1E+6	>1E+6	>1E+6
Benzo (b) Fluoranthene	<0.230	<0.230	<0.230	<0.240	<0.230	<0.230	<0.220	<0.220	<0.210	<0.230	12	12	58	1200	136	>1E+6	>1E+6	>1E+6	>1E+6
Benzo (k) Fluoranthene	<0.230	<0.230	<0.230	<0.240	<0.230	<0.230	<0.220	<0.220	<0.210	<0.230	120	120	580	12000	1270	>1E+6	>1E+6	>1E+6	>1E+6
Chrysene	<0.230	<0.230	<0.230	<0.240	<0.230	<0.230	<0.220	<0.220	<0.210	<0.230	1,200	1200	5800	120000	3870	>1E+6	>1E+6	>1E+6	>1E+6
Dibenz (a,h) Anthracene	<0.230	<0.230	<0.230	<0.240	<0.230	<0.230	<0.220	<0.220	<0.210	<0.230	1.2	1.2	5.8	120	46.6	853000	>1E+6	>1E+6	>1E+6
Indeno (1,2,3-cd) Pyrene	<0.110	<0.110	<0.120	<0.120	<0.120	<0.120	<0.110	<0.110	<0.110	<0.110	12	12	58	1200	1020	>1E+6	>1E+6	>1E+6	>1E+6
Naphthalene	<0.230	<0.230	<0.230	<0.240	<0.230	4.6	<0.220	<0.220	<0.210	<0.230	52.7	90	450	560	0.511	52.7	330	1670	1050
Total Petroleum Hydrocarbons (TF	PH)	_		_		-	_		-	-		-							
ТРН (С6-С12)	<2.3	<2.3	<2.3	<2.4	5.9	980	5.4	2.3	2.6	<2.3	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
ТРН (С10-С20)	<17	18	100	<18	<17	410	<16	<16	16	22	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
ТРН (С20-С34)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000

All results in mg/kg.

Yellow shading denotes sample removed during soil excavation remediation.

Blue shading denotes detection of analyte.

 Table 2

 New Site-wide Soil Maximum Concentrations Compared to BUSTR Action Levels

	New Site-wide	Maximum									
						Soil Direct	Soil to				
Sample ID	Concentration	Location	BUSTR	Soil Direct	Soil Direct	Contact -	Drinking	Soil to	Soil to	Soil to	
Depth			Delineation	Contact -	Contact - Non-	Excavation	Water	Indoor Air	Indoor Air	Outdoor Air	Soil to Outdoor
Sampling Date			Action Level	Residential	Residential	Worker	Leaching	(Res)	(Non-Res)	(Res)	Air (non-res)
Volatile Organic Compounds (VO	Cs)										
Benzene	<0.0068	T2SB4	1.67	26	140	1200	0.246	1.67	10.5	52.7	33.2
Toluene	0.032	DD-1	1,240	820	820	820	70.7	1240	20200	39200	64000
Ethylbenzene	0.031	DD-1	406	130	480	480	84.5	406	6590	12800	20900
Total Xylenes	0.019	DD-1	42.7	260	260	260	1030	42.7	693	1350	2200
Naphthalene	0.061	DD-1	52.7	90	450	560	0.511	52.7	330	1670	1050
1,2,4 Trimethyl Benzene	0.23	DD-1	5.35	160	220	220	2.37	5.35	86.7	169	275
MTBE	<0.0068	T2SB4	150	1100	5700	8900	1.58	150	940	4740	2990
1,2 - Dibromoethane (EDB)	<0.00096	T1SB11	0.154	0.83	4.4	38	0.000982	0.154	0.961	4.86	3.06
1,2 - Dichloroethane (EDC)	0.013	T1SB4	1.01	11	56	480	0.101	1.01	6.33	31.9	20.1
Polynuclear Aromatics (PAHs)				-							
Benzo (a) Anthracene	0.84	T1SB5	12	12	58	1200	38.1	72800	456000	>1E+6	>1E+6
Benzo (a) Pyrene	0.83	T1SB5	1.2	1.2	5.8	120	29.2	213000	>1E+6	>1E+6	>1E+6
Benzo (b) Fluoranthene	0.95	T1SB5	12	12	58	1200	136	>1E+6	>1E+6	>1E+6	>1E+6
Benzo (k) Fluoranthene	0.33	T1SB5	120	120	580	12000	1270	>1E+6	>1E+6	>1E+6	>1E+6
Chrysene	0.75	T1SB5	1,200	1200	5800	120000	3870	>1E+6	>1E+6	>1E+6	>1E+6
Dibenz (a,h) Anthracene	<0.240	T2SB1-S	1.2	1.2	5.8	120	46.6	853000	>1E+6	>1E+6	>1E+6
Indeno (1,2,3-cd) Pyrene	0.39	T1SB5	12	12	58	1200	1020	>1E+6	>1E+6	>1E+6	>1E+6
Naphthalene	<0.27	T2SB4	52.7	90	450	560	0.511	52.7	330	1670	1050
Total Petroleum Hydrocarbons (T	PH)	-	-	-		-	-	-	-	-	
TPH (C6-C12)	210	DD-1	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
ТРН (С10-С20)	1700	DD-1	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
TPH (C20-C34)	200	DD-1	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
All results in mg/kg.											

Blue shading denotes detection of analyte.

# **APPENDIX** A

Groundwater Remediation Documentation

- Provectus Product Sheets
- Provectus Case Study



VIA EMAIL: imartin@pandeyenvironmental.com

December 19, 2022

Mr. Jason Martin Remediation Project Manager Pandey Environmental (614) 444.8078 ext. 203

Subject: Privileged and Confidential Provect-OX<sup>®</sup> Combined ISCO + Sustained Bioremediation Technology Columbus Road, Canton Ohio; Ohio BUSTR Site Provectus Proposal No. PEP22-0172-REV1

Dear Jason:

Please find herewith a remedial design and cost proposal for employing Provect-OX<sup>®</sup> combined *in situ* chemical oxidation (ISCO) + enhanced bioremediation (iron cycling) technology to remove organic constituents of interest (COIs) residuals from saturated soils along with groundwater at the above referenced Site. In developing this proposal, Provectus Environmental Products, Inc. (Provectus) recognizes that we may have received sensitive data and confidential information. We maintained all information in confidence and have not shared Site data with any unapproved party.

#### **PROVECT-OX® TECHNOLOGY BACKGROUND**

Provect-OX<sup>®</sup> (US Patent 9,126,245; patents pending) rapidly oxidizes a wide variety of organic COIs present in impacted soil, sediment and groundwater (including chlorinated solvents, petroleum hydrocarbons, and pesticides) and provides long-term, sustained secondary bioremediation to manage residuals and prevent contaminant rebound (COI rebound is a common problem encountered with conventional ISCO technologies). This is accomplished by using ferric iron (Fe III) as a safe and effective means of activating persulfate, which quickly yields sulfate and ferrate radicals for ISCO treatment (see below for more details). The process also enhances subsequent utilization of sulfate and iron as terminal electron acceptors for facultative redox reactions to support secondary biodegradation of any residual COIs. This remedy combines treatment mechanisms thereby allowing for a more cost-efficient use of the technologies.

The use of ferric iron to activate persulfate was thoroughly described in 1958 (J.F. Henderson, McGill University, Montreal, Canada). However, the safe, non-extreme, advanced activation catalyst is unique when considering its ability to enhance bioremediation processes over an extended period of time (patents pending). Alternative methods of stimulating secondary biodegradation processes using oxygen release compounds are limited in that they will remain



active for only a few months, after which time the oxygen release is exhausted. Iron, on the other hand, will remain active for years. Moreover, oxygen release compounds inherently increase the local pH to extremely basic conditions (>10 pH units) which is simply not conducive to biological activity. Given its non-extreme activation chemistry, additional benefits include: i) Provect-OX will not generate excessive heat / off-gases, ii) nor will it mobilize heavy metals or generate secondary impact issues such as elevated arsenic or chromium resulting from grossly elevated pH.

# PROVECT-OX<sup>®</sup> MODE OF ACTION

Provect-OX<sup>®</sup> maximizes the synergy between persulfate and iron for coupled oxidation and enhanced bioremediation: i) sulfate is generated from persulfate, ii) ferric iron (Fe III) is microbiologically reduced to ferrous iron (Fe II), readily supplying electrons to exchange and react with sulfide. Together, sulfide and iron form pyrite, an iron bearing soil mineral with a favorable reductive capacity.

ISCO: Immediately upon wetting, persulfate is activated by Fe III. This compound requires a lower activation energy than alternative mechanisms while not consuming the persulfate oxidant. The mechanism is believed to elevate the oxidation state of the iron transiently to a supercharged iron ion, which in itself may act as an oxidant. As this supercharged iron cation is consumed, the resulting ferric species can act as a terminal electron acceptor for



biological attenuation. Coincidentally, the generated sulfate ion from the decomposition of the persulfate provides a terminal electron acceptor for sulfate reducers which may further remediate the targeted compounds in the groundwater and soils.

When ferric oxide is used to activate persulfate the process quickly yields ferrate (tetraoxy iron or  $FeO_4^{2-}$  or Fe(VI)) - Equation 1 - in addition to the standard persulfate radicals (SO<sub>4</sub>•; E<sup>o</sup> = 2.600 V).

 $S_2O_8^{-2} + Fe^{+3} - Fe^{(+4 \text{ to}+6)} + SO_4^{2-} + SO_4^{2-}$  (Eq. 1)

Ferrate functions both as an oxidant and subsequent coagulant in the form of Fe(III) (hydro)oxides that can immobilize heavy metals, such as arsenic, cadmium, copper, and zinc. Ferrate also has one of the highest oxidation potentials of any chemical realistically usable in water and wastewater treatment;  $E^{\circ} = 2.200$  V under acidic condition and  $E^{\circ} = 0.72$  V under basic condition, making the protonated forms of ferrate the most reactive, but least stable and shorter lived. As such, it is beneficial to generate ferrate *in situ* for the treatment of groundwater contaminants.



**SECONDARY ATTENUATION PROCESS**: Provect-OX<sup>®</sup> is uniquely designed to couple sulfate radicals and ferrate for ISCO with a strong biological component to the remedial action.

<u>Sulfate Residuals:</u> After dissolved oxygen has been depleted in the treatment area, sulfate (a byproduct of the persulfate oxidation) may be used as an electron acceptor for anaerobic biodegradation by indigenous microbes. This process is termed sulfidogenesis and results in the production of sulfide. Stoichiometrically, each 1.0 mg/L of sulfate consumed by microbes results in the destruction of approximately 0.21 mg/L of BTEX compounds. Sulfate can play an important role in bioremediation of petroleum products, acting as an electron acceptor in co-metabolic processes as well. For example, the basic reactions for the mineralization of benzene and toluene under sulfate reducing conditions are presented in Equations 2 and 3:

### C<sub>6</sub>H<sub>6</sub> + 3.75 SO<sub>4</sub><sup>2-</sup> + 3 H<sub>2</sub>O --> 0.37 H<sup>+</sup> + 6 HCO<sub>3</sub><sup>-</sup> + 1.87 HS<sup>-</sup> + 1.88 H<sub>2</sub>S<sup>-</sup> (Eq. 2)

# $C_7H_8 + 4.5 \text{ SO}_4^{2-} + 3 H_2O --> 0.25 H^+ + 7 HCO_3^- + 2.25 HS^- + 2.25 H_2S^-$ (Eq. 3)

<u>Ferric Iron</u>: Ferric iron is also used as an electron acceptor during anaerobic biodegradation of many contaminants, sometimes in conjunction with sulfate. During this process, ferric iron is reduced to ferrous iron, which is soluble in water. Hence, ferrous iron may be used as an indicator of anaerobic activity. As an example, stoichiometrically, the degradation of 1 mg/L of BTEX results in the average consumption of approximately 22 mg/L of ferric iron (or "production" of ferrous iron) as shown below (Equations 4-6).

 $C_{6}H_{6} + 18 H_{2}O + 30 Fe^{3+} ----> 6 HCO_{3}^{-} + 30 Fe^{2+} + 36 H^{+} \quad (Eq. 4)$   $C_{7}H_{8} + 21 H_{2}O + 36 Fe^{3+} ----> 7 HCO_{3}^{-} + 36 Fe^{2+} + 43 H^{+} \quad (Eq. 5)$   $C_{8}H_{10} + 24 H_{2}O + 42 Fe^{3+} ----> 8 HCO_{3}^{-} + 42 Fe^{2+} + 50 H^{+} \quad (Eq. 6)$ 

<u>Pyrite Formation:</u> While ferrous iron is formed as a result of the use of the ferric species as a terminal electron acceptor, residual sulfate is utilized as a terminal electron acceptor by facultative organisms thereby generating sulfide under these same conditions. Together, the ferrous iron and the sulfide promote the formation of pyrite as a remedial byproduct (Equation 7). This reaction combats the toxic effects of sulfide and hydrogen sulfide accumulation on the facultative bacteria, while also providing a means of removing targeted organic and inorganic COIs via precipitation reactions. Moreover, pyrite possesses a high number of reactive sites that are directly proportional to both its reductive capacity and the rate of decay for the target organics.

**Fe<sup>2+</sup> + 2S<sup>2-</sup> -----> FeS<sub>2</sub> + 2e** (Eq. 7)

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# ADVANTAGES OF USING PROVECT-OX® ISCO TECHNOLOGY

Provect-OX<sup>®</sup> is a dry, pre-mixed powder material that can be easily injected into the subsurface environment in a variety of ways, based on site-specific designs. Application methods include direct mixing, hydraulic fracturing, pneumatic fracturing, and injection of slurries or liquids. Direct placement in trenches and excavations are also reliable application methods. Once emplaced, a number of synergistic reactions take place that offer some notable advantages over other persulfate-based oxidation processes:

<u>More Effective</u>: Promotes multiple oxidation reactions and free radicals yielding the most effective *situ* oxidation of a wide-range of organic contaminants. Also provides a unique microbiological component for multiple accelerated attenuation processes.

<u>More Efficient</u>: Significantly lower costs as a result of multiple oxidants and secondary treatment processes. Use of ferric oxide conserves oxidant when compared to EDTA-Fe III chelated iron activation.

<u>Safer</u>: Fewer health and safety concerns as compared to use of traditional activation methods such as heat, chelated metals, and hydrogen peroxide or pH extremes using NaOH.

- Contains built-in activation which eliminates the need for additional and potentially hazardous chemicals required to achieve traditional persulfate activation
- ✓ Will not generate excessive heat / off-gases

<u>Easy to Use</u>: Pre-mixed product with integrated activator and Terr-OR<sup>™</sup> buffer/ferrate stabilizer results in simplified logistics and application.

- ✓ No additional containers or multi-step mixing ratios required prior during field application
- ✓ Fewer handling logistics and equipment compatibility issues
- ✓ No secondary containment requirements

<u>Improved Performance</u>: Combined remedy maximizes the inherent geochemistry of a "post-oxidation" environment for biologically based attenuation to prevent "rebound".

- The ferrous iron and the sulfide promote the formation of pyrite to combat the toxic effects of sulfide and hydrogen sulfide accumulation while also providing a means of removing targeted organic and inorganic contaminants via precipitation reactions. Moreover, pyrite possesses a high number of reactive sites that are directly proportional to both its reductive capacity and the rate of decay for the target organics
- Will not mobilize heavy metals or lead to the generation of secondary impact issues such as elevated arsenic, chromium resulting from grossly elevated pH

<u>Longevity</u>. Uniquely supports long-term, <u>sustained</u> (>3 to 4 years), secondary bioremediation processes to manage residuals and prevent contaminant rebound. Iron will remain in place and active for many years.



- Patented Technology: Fully covered under numerous patents (7,129,388; 7,531,709; 7,828,974; 8,147,694; 13/785,840; 14/268,629) that indemnify you and your client from patent infringement.
- <u>Permanence = Treatment versus Short-Term Physical Adsorption:</u> Provectus technologies permanently degrade the targeted COIs and do not rely on physical sorption reactions that are contact dependent and ultimately reversible (*i.e.*, materials can be "trapped" onto activated carbon but treatment is not always discernible).

#### UNDERSTANDING SITE CONDITIONS AND REMEDIAL GOALS

The site is a previous fueling station with impacts from fuel storage and transport. Groundwater is typically located between 30 to 35 feet below ground surface (bgs). Primary contaminant impacts consist of benzene, xylene, naphthalene and 1,2,4-trimethylbenzene as summarized in **Table 1**. The site will initially undergo excavation of impacted soils down to groundwater depth. The excavation area is estimated to be 4,800 square feet. Following excavation, Provect-OX<sup>®</sup> will be blended into the upper saturated soil zone. It is estimated that a 3-foot vertical zone will be targeted with the blending. The excavation area is shown in **Figure 1**. The impacted area for injection treatment is shown in **Figure 2**. The injection treatment area is assumed to be 4,200 square feet. The treatment interval is from 30 feet to 40 feet below ground surface and shown in **Figures 3** and **4**.



### Figure 1: Site map showing proposed excavation area

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Figure 3: Injection zone West-East Cross Section



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Contaminant	Highest Reported Value	Sample Location
Benzene	0.19 mg/L	MW2
Xylene	4.8 mg/L	MW1
Naphthalene	0.50 mg/L	MW1
1,2,4 Trimethylbenzene	3.2 mg/L	MW1

#### CONCEPTUAL REMEDIAL DESIGN AND MATERIAL REQUIREMENTS

The initial steps will be to excavate an estimated 80' x 60' area down to groundwater depth. These contaminated vadose zone soils are to be disposed of separately. Following excavation, 12,000 pounds of Provect-OX<sup>®</sup> will be blended into the upper saturated zone. This represents 0.75% of the soil mass in the 3-foot vertical target zone. The targeted injection area will be addressed with 15 direct push injection points and 10,500 lbs. of Provect-OX<sup>®</sup>. Each injection point will receive 700 pounds of oxidant split between two vertical intervals. Calculations for required amendment are based on soil oxidant demand (SOD) of 1.5 grams of Provect-OX<sup>®</sup> per kg of soil. Oxidant loading at 25% by weight of injection slurry will require approximately 3,800 gallons of water. Therefore, each vertical injection interval will receive approximately 350 pounds of Provect-OX<sup>®</sup> and 125 gallons of water. It is estimated that three days will be required for completion of the injection project including mobilization and de-mobilization.



# Provect-OX<sup>®</sup> - *In Situ* Chemical Oxidation + Enhanced Bioremediation for Source Area Remediation

Former Gasoline Station: Madison, New Jersey Contaminants of Interest: LNAPL, BTEX, and TMB

## **Project Summary**

At a former gas station in Madison, New Jersey, *in situ* remediation was applied to address petroleum hydrocarbon source mass within the subsurface smear and saturated zones. Excavation of gasoline and fuel oil underground tanks (USTs) along with the associated piping and shallow hydrocarbon soil impacts had previously been completed. However, excavation was impacted due to accessibility limitations from the service center building and road. Following excavation and enhanced fluid recovery activities, residual benzene, toluene, ethylbenzene, xylene (BTEX), trimethylbenzene (TMB), and light non-aqueous phase liquid (LNAPL) impacts remained. The primary area of concern (AOC; **Figure 1**) was approximately 1,500 sq ft with a 15-ft vertical target interval from approximately 25 to 40 feet below ground surface (bgs). The geology at the site is dense silt and clay with depth to groundwater at 30 ft bgs. The *in situ* injection program targeted the BTEX, TMB, and LNAPL with Provect-OX<sup>®</sup> (US Patent 9,126,245), which is a catalyzed chemical oxidation process that leverages enhanced bioremediation post-oxidation.





# **Remediation Plan**

The remedial program was developed by Engineering & Land Planning Associates, Inc. (E&LP) and Provectus Environmental Products, Inc. (Provectus) with *in situ* implementation provided by Innovative Environmental Technologies, Inc. (IET). A total of 13,300 lbs of Provect-OX<sup>®</sup> were applied via 20 temporary direct push injection locations to treat the AOC and two impacted monitoring wells. The service center remained open and active during drilling and injection activities.



Provect-OX<sup>®</sup> rapidly oxidizes the organic contaminants present in soil and groundwater and provides long-term, sustained secondary bioremediation to manage residuals and prevent contaminant rebound. This is accomplished by using ferric iron (Fe III) as a safe and effective means of activating persulfate, which quickly yields sulfate and ferrate (site-specific) radicals for chemical oxidation treatment. A pH buffer is also preblended with the Provect-OX<sup>®</sup> to offset any post-injection acidic pH conditions that are normally observed with traditional persulfate applications. The technology process enhances subsequent utilization of sulfate and iron as terminal electron acceptors for facultative redox reactions to support secondary biodegradation of any residual contaminant mass.

### **Treatment Program Results**

Field and geochemical data for the two target monitoring wells are presented below in **Table 1** and **Table 2**. Volatile organic compound (VOC) data for the monitoring wells are presented in **Table 3** and **Table 4**. Chemical oxidative conditions are evident during the first MW-6R and MW-9 post-treatment sampling event with increased ORPs of +354 mV and +32.6, respectively. The presence of persulfate, sulfate, and iron in groundwater confirmed that Provect-OX<sup>®</sup> was successfully distributed within the targeted area. The included pH buffer component of the product offset production of sulfuric acid that is created due to persulfate activation (e.g., common persulfate applications exhibit pH <4). During the November 2019 sampling event (3 months post-injection), the ORPs in both wells are negative with transition back to a reducing environment starting to occur.

			N	/IW-6R						
Sampling Date	08/2019 (Baseline)	09/19	10/19	11/19	01/20	02/20	03/20	05/20	08/20	09/21
рН	7.28	-	-	5.92	-	6.35	-	7.03	7.01	6.42
ORP (mV)	-139	+354	+234	-15.8	-21.1	-44	-70	-62	-70	-101
Persulfate (mg/L)	0	70	-	42	21	7	14	0	0	0
Sulfate (mg/L)	ND	-	-	ND	-	1,890	-	980	ND*	720
Iron (mg/L)	7.8	-	-	21	-	34.2	-	18.4	21.7	23.4

### Table 1. Field and Geochemical Data for MW-6R

\*Minimum detection limit of 109 mg/L

Table 2. Field and	Geochemical	Data for I	NW-9
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				MW-9						
Sampling Date	08/2019 (Baseline)	09/19	10/19	11/19	01/20	02/20	03/20	05/20	08/20	09/21
рН	7.21	-	-	6.49	-	6.75	-	7.09	7.05	6.34
ORP (mV)	-102	+32.6	+23.4	-48.4	-47.8	-134	-77	-68	-207	-87
Persulfate (mg/L)	0	0	-	0	0	0	0	0	0	0
Sulfate (mg/L)	ND	-	-	1,170	-	302	-	307	148	1,230
Iron (mg/L)	8.6	-	-	38.3	-	24.0	-	7.88	11.0	24.2



Following the Provect-OX<sup>®</sup> application, petroleum hydrocarbon groundwater concentrations have significantly decreased (**Table 3** and **Table 4**). MW-6R exhibited >89% reduction concentrations for all target VOCs other than ethylbenzene (>68% decrease). The VOC reductions in MW-9 were >88% and LNAPL has been eliminated. Additional contaminant concentration decreases in MW-6R and MW-9 are anticipated due to the iron and sulfate enhanced bioremediation processes.

		М	W-6R				
Sampling Date	08/2019 (Baseline)	11/19	02/20	05/20	08/20	09/21	Reductions
Benzene (µg/L)	0.129	0.732	0.698	0.560	ND	0.129	-
Ethylbenzene (µg/L)	2,510	279	489	1,270	906	784	68.8%
Total Xylenes (µg/L)	5,910	388	123	103	33	621	89.5%
Toluene (μg/L)	1,790	140	6	15	45	2.5	99.9%
1,2,4-Trimethylbenzene (µg/L)	5,460	22	162	430	134	56.6	99.0%

# Table 3. VOC Data for MW-6R

ND: Non-Detect

# Table 4. VOC Data for MW-9

MW-9										
Sampling Date	08/2019 (Baseline)	11/19	02/20	05/20	08/20	9/21	Reductions			
Benzene (µg/L)	29.7	14.2	9.7	10.3	6.5	3.56	88.0%			
Ethylbenzene (µg/L)	1,590	1,200	331	1,140	279	115	92.8%			
Total Xylenes (µg/L)	6,280	4,070	1,130	1,610	360	84.2	98.7%			
Toluene (μg/L)	7,680	3,690	628	198	52.6	53.3	99.3%			
1,2,4-Trimethylbenzene (µg/L)	5,670	3,870	600	2,520	882	357	93.7%			





Please contact our office at (815) 650-2230 or via email at <u>info@provectusenv.com</u> for additional information regarding this project or our technologies.

# ATTACHMENT 5 Provectus Product Documentation



VIA EMAIL: imartin@pandeyenvironmental.com

December 19, 2022

Mr. Jason Martin Remediation Project Manager Pandey Environmental (614) 444.8078 ext. 203

Subject: Privileged and Confidential Provect-OX<sup>®</sup> Combined ISCO + Sustained Bioremediation Technology Columbus Road, Canton Ohio; Ohio BUSTR Site Provectus Proposal No. PEP22-0172-REV1

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### C<sub>6</sub>H<sub>6</sub> + 3.75 SO<sub>4</sub><sup>2-</sup> + 3 H<sub>2</sub>O --> 0.37 H<sup>+</sup> + 6 HCO<sub>3</sub><sup>-</sup> + 1.87 HS<sup>-</sup> + 1.88 H<sub>2</sub>S<sup>-</sup> (Eq. 2)

# $C_7H_8 + 4.5 \text{ SO}_4^{2-} + 3 H_2O --> 0.25 H^+ + 7 HCO_3^- + 2.25 HS^- + 2.25 H_2S^-$ (Eq. 3)

<u>Ferric Iron</u>: Ferric iron is also used as an electron acceptor during anaerobic biodegradation of many contaminants, sometimes in conjunction with sulfate. During this process, ferric iron is reduced to ferrous iron, which is soluble in water. Hence, ferrous iron may be used as an indicator of anaerobic activity. As an example, stoichiometrically, the degradation of 1 mg/L of BTEX results in the average consumption of approximately 22 mg/L of ferric iron (or "production" of ferrous iron) as shown below (Equations 4-6).

 $C_{6}H_{6} + 18 H_{2}O + 30 Fe^{3+} ----> 6 HCO_{3}^{-} + 30 Fe^{2+} + 36 H^{+} \quad (Eq. 4)$   $C_{7}H_{8} + 21 H_{2}O + 36 Fe^{3+} ----> 7 HCO_{3}^{-} + 36 Fe^{2+} + 43 H^{+} \quad (Eq. 5)$   $C_{8}H_{10} + 24 H_{2}O + 42 Fe^{3+} ----> 8 HCO_{3}^{-} + 42 Fe^{2+} + 50 H^{+} \quad (Eq. 6)$ 

<u>Pyrite Formation:</u> While ferrous iron is formed as a result of the use of the ferric species as a terminal electron acceptor, residual sulfate is utilized as a terminal electron acceptor by facultative organisms thereby generating sulfide under these same conditions. Together, the ferrous iron and the sulfide promote the formation of pyrite as a remedial byproduct (Equation 7). This reaction combats the toxic effects of sulfide and hydrogen sulfide accumulation on the facultative bacteria, while also providing a means of removing targeted organic and inorganic COIs via precipitation reactions. Moreover, pyrite possesses a high number of reactive sites that are directly proportional to both its reductive capacity and the rate of decay for the target organics.

**Fe<sup>2+</sup> + 2S<sup>2-</sup> -----> FeS<sub>2</sub> + 2e** (Eq. 7)

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# ADVANTAGES OF USING PROVECT-OX® ISCO TECHNOLOGY

Provect-OX<sup>®</sup> is a dry, pre-mixed powder material that can be easily injected into the subsurface environment in a variety of ways, based on site-specific designs. Application methods include direct mixing, hydraulic fracturing, pneumatic fracturing, and injection of slurries or liquids. Direct placement in trenches and excavations are also reliable application methods. Once emplaced, a number of synergistic reactions take place that offer some notable advantages over other persulfate-based oxidation processes:

<u>More Effective</u>: Promotes multiple oxidation reactions and free radicals yielding the most effective *situ* oxidation of a wide-range of organic contaminants. Also provides a unique microbiological component for multiple accelerated attenuation processes.

<u>More Efficient</u>: Significantly lower costs as a result of multiple oxidants and secondary treatment processes. Use of ferric oxide conserves oxidant when compared to EDTA-Fe III chelated iron activation.

<u>Safer</u>: Fewer health and safety concerns as compared to use of traditional activation methods such as heat, chelated metals, and hydrogen peroxide or pH extremes using NaOH.

- Contains built-in activation which eliminates the need for additional and potentially hazardous chemicals required to achieve traditional persulfate activation
- ✓ Will not generate excessive heat / off-gases

<u>Easy to Use</u>: Pre-mixed product with integrated activator and Terr-OR<sup>™</sup> buffer/ferrate stabilizer results in simplified logistics and application.

- ✓ No additional containers or multi-step mixing ratios required prior during field application
- ✓ Fewer handling logistics and equipment compatibility issues
- ✓ No secondary containment requirements

<u>Improved Performance</u>: Combined remedy maximizes the inherent geochemistry of a "post-oxidation" environment for biologically based attenuation to prevent "rebound".

- The ferrous iron and the sulfide promote the formation of pyrite to combat the toxic effects of sulfide and hydrogen sulfide accumulation while also providing a means of removing targeted organic and inorganic contaminants via precipitation reactions. Moreover, pyrite possesses a high number of reactive sites that are directly proportional to both its reductive capacity and the rate of decay for the target organics
- Will not mobilize heavy metals or lead to the generation of secondary impact issues such as elevated arsenic, chromium resulting from grossly elevated pH

<u>Longevity</u>. Uniquely supports long-term, <u>sustained</u> (>3 to 4 years), secondary bioremediation processes to manage residuals and prevent contaminant rebound. Iron will remain in place and active for many years.



- Patented Technology: Fully covered under numerous patents (7,129,388; 7,531,709; 7,828,974; 8,147,694; 13/785,840; 14/268,629) that indemnify you and your client from patent infringement.
- <u>Permanence = Treatment versus Short-Term Physical Adsorption:</u> Provectus technologies permanently degrade the targeted COIs and do not rely on physical sorption reactions that are contact dependent and ultimately reversible (*i.e.*, materials can be "trapped" onto activated carbon but treatment is not always discernible).

#### UNDERSTANDING SITE CONDITIONS AND REMEDIAL GOALS

The site is a previous fueling station with impacts from fuel storage and transport. Groundwater is typically located between 30 to 35 feet below ground surface (bgs). Primary contaminant impacts consist of benzene, xylene, naphthalene and 1,2,4-trimethylbenzene as summarized in **Table 1**. The site will initially undergo excavation of impacted soils down to groundwater depth. The excavation area is estimated to be 4,800 square feet. Following excavation, Provect-OX<sup>®</sup> will be blended into the upper saturated soil zone. It is estimated that a 3-foot vertical zone will be targeted with the blending. The excavation area is shown in **Figure 1**. The impacted area for injection treatment is shown in **Figure 2**. The injection treatment area is assumed to be 4,200 square feet. The treatment interval is from 30 feet to 40 feet below ground surface and shown in **Figures 3** and **4**.



### Figure 1: Site map showing proposed excavation area

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Figure 3: Injection zone West-East Cross Section



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Contaminant	Highest Reported Value	Sample Location
Benzene	0.19 mg/L	MW2
Xylene	4.8 mg/L	MW1
Naphthalene	0.50 mg/L	MW1
1,2,4 Trimethylbenzene	3.2 mg/L	MW1

#### CONCEPTUAL REMEDIAL DESIGN AND MATERIAL REQUIREMENTS

The initial steps will be to excavate an estimated 80' x 60' area down to groundwater depth. These contaminated vadose zone soils are to be disposed of separately. Following excavation, 12,000 pounds of Provect-OX<sup>®</sup> will be blended into the upper saturated zone. This represents 0.75% of the soil mass in the 3-foot vertical target zone. The targeted injection area will be addressed with 15 direct push injection points and 10,500 lbs. of Provect-OX<sup>®</sup>. Each injection point will receive 700 pounds of oxidant split between two vertical intervals. Calculations for required amendment are based on soil oxidant demand (SOD) of 1.5 grams of Provect-OX<sup>®</sup> per kg of soil. Oxidant loading at 25% by weight of injection slurry will require approximately 3,800 gallons of water. Therefore, each vertical injection interval will receive approximately 350 pounds of Provect-OX<sup>®</sup> and 125 gallons of water. It is estimated that three days will be required for completion of the injection project including mobilization and de-mobilization.



# Provect-OX<sup>®</sup> - *In Situ* Chemical Oxidation + Enhanced Bioremediation for Source Area Remediation

Former Gasoline Station: Madison, New Jersey Contaminants of Interest: LNAPL, BTEX, and TMB

## **Project Summary**

At a former gas station in Madison, New Jersey, *in situ* remediation was applied to address petroleum hydrocarbon source mass within the subsurface smear and saturated zones. Excavation of gasoline and fuel oil underground tanks (USTs) along with the associated piping and shallow hydrocarbon soil impacts had previously been completed. However, excavation was impacted due to accessibility limitations from the service center building and road. Following excavation and enhanced fluid recovery activities, residual benzene, toluene, ethylbenzene, xylene (BTEX), trimethylbenzene (TMB), and light non-aqueous phase liquid (LNAPL) impacts remained. The primary area of concern (AOC; **Figure 1**) was approximately 1,500 sq ft with a 15-ft vertical target interval from approximately 25 to 40 feet below ground surface (bgs). The geology at the site is dense silt and clay with depth to groundwater at 30 ft bgs. The *in situ* injection program targeted the BTEX, TMB, and LNAPL with Provect-OX<sup>®</sup> (US Patent 9,126,245), which is a catalyzed chemical oxidation process that leverages enhanced bioremediation post-oxidation.





# **Remediation Plan**

The remedial program was developed by Engineering & Land Planning Associates, Inc. (E&LP) and Provectus Environmental Products, Inc. (Provectus) with *in situ* implementation provided by Innovative Environmental Technologies, Inc. (IET). A total of 13,300 lbs of Provect-OX<sup>®</sup> were applied via 20 temporary direct push injection locations to treat the AOC and two impacted monitoring wells. The service center remained open and active during drilling and injection activities.



Provect-OX<sup>®</sup> rapidly oxidizes the organic contaminants present in soil and groundwater and provides long-term, sustained secondary bioremediation to manage residuals and prevent contaminant rebound. This is accomplished by using ferric iron (Fe III) as a safe and effective means of activating persulfate, which quickly yields sulfate and ferrate (site-specific) radicals for chemical oxidation treatment. A pH buffer is also preblended with the Provect-OX<sup>®</sup> to offset any post-injection acidic pH conditions that are normally observed with traditional persulfate applications. The technology process enhances subsequent utilization of sulfate and iron as terminal electron acceptors for facultative redox reactions to support secondary biodegradation of any residual contaminant mass.

### **Treatment Program Results**

Field and geochemical data for the two target monitoring wells are presented below in **Table 1** and **Table 2**. Volatile organic compound (VOC) data for the monitoring wells are presented in **Table 3** and **Table 4**. Chemical oxidative conditions are evident during the first MW-6R and MW-9 post-treatment sampling event with increased ORPs of +354 mV and +32.6, respectively. The presence of persulfate, sulfate, and iron in groundwater confirmed that Provect-OX<sup>®</sup> was successfully distributed within the targeted area. The included pH buffer component of the product offset production of sulfuric acid that is created due to persulfate activation (e.g., common persulfate applications exhibit pH <4). During the November 2019 sampling event (3 months post-injection), the ORPs in both wells are negative with transition back to a reducing environment starting to occur.

MW-6R										
Sampling Date	08/2019 (Baseline)	09/19	10/19	11/19	01/20	02/20	03/20	05/20	08/20	09/21
рН	7.28	-	-	5.92	-	6.35	-	7.03	7.01	6.42
ORP (mV)	-139	+354	+234	-15.8	-21.1	-44	-70	-62	-70	-101
Persulfate (mg/L)	0	70	-	42	21	7	14	0	0	0
Sulfate (mg/L)	ND	-	-	ND	-	1,890	-	980	ND*	720
Iron (mg/L)	7.8	-	-	21	-	34.2	-	18.4	21.7	23.4

### Table 1. Field and Geochemical Data for MW-6R

\*Minimum detection limit of 109 mg/L

Table 2. Field and	Geochemical	Data for M	NW-9
--------------------	-------------	------------	------

MW-9										
Sampling Date	08/2019 (Baseline)	09/19	10/19	11/19	01/20	02/20	03/20	05/20	08/20	09/21
рН	7.21	-	-	6.49	-	6.75	-	7.09	7.05	6.34
ORP (mV)	-102	+32.6	+23.4	-48.4	-47.8	-134	-77	-68	-207	-87
Persulfate (mg/L)	0	0	-	0	0	0	0	0	0	0
Sulfate (mg/L)	ND	-	-	1,170	-	302	-	307	148	1,230
Iron (mg/L)	8.6	-	-	38.3	-	24.0	-	7.88	11.0	24.2



Following the Provect-OX<sup>®</sup> application, petroleum hydrocarbon groundwater concentrations have significantly decreased (**Table 3** and **Table 4**). MW-6R exhibited >89% reduction concentrations for all target VOCs other than ethylbenzene (>68% decrease). The VOC reductions in MW-9 were >88% and LNAPL has been eliminated. Additional contaminant concentration decreases in MW-6R and MW-9 are anticipated due to the iron and sulfate enhanced bioremediation processes.

MW-6R										
Sampling Date	08/2019 (Baseline)	11/19	02/20	05/20	08/20	09/21	Reductions			
Benzene (µg/L)	0.129	0.732	0.698	0.560	ND	0.129	-			
Ethylbenzene (µg/L)	2,510	279	489	1,270	906	784	68.8%			
Total Xylenes (µg/L)	5,910	388	123	103	33	621	89.5%			
Toluene (μg/L)	1,790	140	6	15	45	2.5	99.9%			
1,2,4-Trimethylbenzene (µg/L)	5,460	22	162	430	134	56.6	99.0%			

# Table 3. VOC Data for MW-6R

ND: Non-Detect

# Table 4. VOC Data for MW-9

MW-9										
Sampling Date	08/2019 (Baseline)	11/19	02/20	05/20	08/20	9/21	Reductions			
Benzene (µg/L)	29.7	14.2	9.7	10.3	6.5	3.56	88.0%			
Ethylbenzene (µg/L)	1,590	1,200	331	1,140	279	115	92.8%			
Total Xylenes (µg/L)	6,280	4,070	1,130	1,610	360	84.2	98.7%			
Toluene (µg/L)	7,680	3,690	628	198	52.6	53.3	99.3%			
1,2,4-Trimethylbenzene (µg/L)	5,670	3,870	600	2,520	882	357	93.7%			





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ATTACHMENT 6 Soil Analytical Data



Table 1a Soil Concentrations Compared to BUSTR Action Levels

		Tier 1 Source Investigation Soil Bores																					
Sample ID	T1SB1	T1SB1	T1SB2	T1SB2	T1SB3	T1SB3	T1SB4	T1SB4	T1SB5	T1SB5	T1SB6	T1SB6	T1SB7	T1SB7				Soil Direct	Soil to		Soil to		Soil to
Depth	26-28'	24-26'	14-16'	26-28'	2-4'	22-23.5'	20-22'	26-28'	2-4'	26-26'	16-18'	24-26'	24-26'	26-28'	BUSTR	Soil Direct	Soil Direct	Contact -	Drinking	Soil to	Indoor	Soil to	Outdoor
							-								Delineation	Contact -	Contact - Non-	Excavation	Water	Indoor	Air (Non-	Outdoor	Air (non-
Sampling Date							9/1	6/2020							Action Level	Residential	Residential	Worker	Leaching	Air (Res)	Res)	Air (Res)	res)
Volatile Organic Compounds (V	OCs)																						
Benzene	<12.8	<0.0057	<0.69	<0.0054	<0.0053	<0.0052	<0.0055	<0.0061	<0.0059	<0.0061	0.0081	<0.0062	<0.0055	0.085	1.67	26	140	1200	0.246	1.67	10.5	52.7	33.2
Ethylbenzene	34.7	<0.0057	2.9	0.0059	<0.0053	<0.0052	<0.0055	<0.0061	<0.0059	<0.0061	<0.0053	<0.0062	<0.0055	0.57	406	130	480	480	84.5	406	6590	12800	20900
Methyl-tert-butyl ether	<12.8	<0.0057	<0.69	<0.0054	<0.0053	<0.0052	<0.0055	<0.0061	<0.0059	<0.0061	<0.0053	<0.0062	<0.0055	<0.0055	150	1100	5700	8900	1.58	150	940	4740	2990
Toluene	<12.8	<0.0057	<0.69	<0.0054	<0.0053	<0.0052	<0.0055	<0.0061	<0.0059	<0.0061	<0.0053	<0.0062	<0.0055	0.025	1,240	820	820	820	70.7	1240	20200	39200	64000
Xylene (Total)	<25.5	<0.011	4.2	0.023	<0.011	<0.010	<0.011	<0.012	<0.012	<0.012	<0.011	<0.012	<0.011	0.57	42.7	260	260	260	1030	42.7	693	1350	2200
Naphthalene	15.6	<0.0057	6.3	0.014	<0.0053	<0.0052	<0.0055	<0.0061	<0.0059	<0.0061	<0.0053	<0.0062	<0.0055	0.046	52.7	90	450	560	0.511	52.7	330	1670	1050
1,2,4-Trimethylbenzene	211	<0.0057	35.6	0.031	<0.0053	<0.0052	<0.0055	<0.0061	<0.0059	< 0.0061	<0.0053	<0.0062	<0.0055	0.81	5.35	160	220	220	2.34	5.35	86.7	169	275
1,2-Dibromoethane (EDB)	<1.9	<0.00085	<0.10	<0.0054	<0.00080	<0.00078	<0.00082	<0.00092	<0.00088	<0.00092	<0.00079	<0.00092	<0.00083	<0.00082	0.154	0.83	4.4	38	0.000982	0.154	0.961	4.86	3.06
1,2-Dichloroethane (EDC)	<12.8	<0.0057	<0.69	<0.00081	<0.0053	<0.0052	<0.0055	0.013	<0.0059	<0.0061	<0.0053	<0.0062	<0.0055	<0.0055	1.01	11	56	480	0.101	1.01	6.33	31.9	20.1
Polynuclear Aromatics																							
Benzo(a)anthracene	<0.0063	0.0061	<0.0062	<0.0052	0.023	<0.0047	<0.0053	<0.0056	0.84	<0.0058	<0.0050	<0.0058	<0.0051	<0.0050	12	12	58	1200	38.1	72800	456000	>1E+6	>1E+6
Benzo(a)pyrene	<0.0063	0.0054	<0.0062	<0.0052	0.025	<0.0047	<0.0053	<0.0056	0.83	<0.0058	<0.0050	<0.0058	<0.0051	<0.0050	1.2	1.2	5.8	120	29.2	213000	>1E+6	>1E+6	>1E+6
Benzo(b)fluoranthene	<0.0063	0.0087	<0.0062	0.006	0.03	<0.0047	<0.0053	<0.0056	0.95	<0.0058	0.0051	<0.0058	<0.0051	<0.0050	12	12	58	1200	136	>1E+6	>1E+6	>1E+6	>1E+6
Benzo(k)fluoranthene	<0.0063	<0.0050	<0.0062	<0.0052	0.011	<0.0047	<0.0053	<0.0056	0.33	<0.0058	<0.0050	<0.0058	<0.0051	<0.0050	120	120	580	12000	1270	>1E+6	>1E+6	>1E+6	>1E+6
Chrysene	<0.0063	0.0089	<0.0062	<0.0052	0.022	<0.0047	<0.0053	<0.0056	0.75	<0.0058	<0.0050	<0.0058	<0.0051	<0.0050	1,200	1200	5800	120000	3870	>1E+6	>1E+6	>1E+6	>1E+6
Dibenz(a,h)anthracene	<0.0063	<0.0050	<0.0062	<0.0052	0.0053	<0.0047	<0.0053	<0.0056	0.15	<0.0058	<0.0050	<0.0058	<0.0051	<0.0050	1.2	1.2	5.8	120	46.6	853000	>1E+6	>1E+6	>1E+6
Ideno(1,2,3-cd)pyrene	<0.0063	<0.0050	<0.0062	<0.0052	0.014	<0.0047	<0.0053	<0.0056	0.39	<0.0058	<0.0050	<0.0058	<0.0051	<0.0050	12	12	58	1200	1020	>1E+6	>1E+6	>1E+6	>1E+6
Naphthalene	1.8	0.26	<0.0062	0.19	0.01	<0.0047	0.028	0.011	0.1	0.0067	<0.0050	0.035	0.52	0.066	52.7	90	450	560	0.511	52.7	330	1670	1050
Total Petroleum Hydrocarbons	(TPHs)																						
TPH (C06-C12)	4,340	<1.1	1,000	<1.1	<1.1	<1.0	<1.1	<1.2	<1.2	<1.2	<1.1	<1.2	3.1	<1.1	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
TPH (C10-C20)	453	<11.3	342	<10.8	<9.8	<10.3	<10.9	<11.8	<11.3	<10.9	<9.9	<10.9	<11.0	24	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
TPH (C20-C34)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000

Yellow shading denotes sample removed during soil excavation remediation.

Blue shading denotes detection of analyte.

NA = Not Analysed

Table 1b Soil Concentrations Compared to BUSTR Action Levels

		Tier 1 Delineation Soil Bores																							
Sample ID	T1SB8	T1SB8	T1SB9	T1SB9	T1SB10	T1SB10	T1SB11	T1SB11	T1SB12	T1SB12	T1SB13	T1SB13	T1SB14	T1SB14	T1SB15	T1SB15			Soil Direct	Soil Direct	Soil to		Soil to		Soil to
Depth	24-26'	26-28'	28-30'	36-38'	2-4'	26-28'	22-24'	26-28'	0-2'	24-26'	28-30'	34-36'	16-18'	34-36'	8-10'	28-30'	BUSTR	Soil Direct	Contact -	Contact -	Drinking	Soil to	Indoor	Soil to	Outdoor
																	Delineation	Contact -	Non-	Excavation	Water	Indoor	Air (Non-	Outdoor	Air (non-
Sampling Date								12/28	3/2020								Action Level	Residential	Residential	Worker	Leaching	Air (Res)	Res)	Air (Res)	res)
Volatile Organic Compounds	s (VOCs)																								
Benzene	<0.0059	<0.0052	0.043	<0.0056	<0.0058	<0.0060	<0.0053	<0.0064	<0.0054	<0.0053	<0.0051	<0.0058	<0.0059	<0.0056	<0.0059	<0.0063	1.67	26	140	1200	0.246	1.67	10.5	52.7	33.2
Ethylbenzene	<0.0059	<0.0052	<0.0054	<0.0056	<0.0058	<0.0060	<0.0053	<0.0064	<0.0054	<0.0053	<0.0051	<0.0058	<0.0059	<0.0056	<0.0059	<0.0063	406	130	480	480	84.5	406	6590	12800	20900
Methyl-tert-butyl ether	<0.0059	<0.0052	<0.0054	<0.0056	<0.0058	<0.0060	<0.0053	<0.0064	<0.0054	<0.0053	<0.0051	<0.0058	<0.0059	<0.0056	<0.0059	<0.0063	150	1100	5700	8900	1.58	150	940	4740	2990
Toluene	<0.0059	<0.0052	0.0088	<0.0056	<0.0058	<0.0060	<0.0053	<0.0064	<0.0054	<0.0053	<0.0051	<0.0058	<0.0059	<0.0056	<0.0059	<0.0063	1,240	820	820	820	70.7	1240	20200	39200	64000
Xylene (Total)	<0.012	<0.01	<0.011	<0.011	<0.012	<0.012	<0.011	<0.013	<0.011	<0.011	<0.010	<0.012	<0.012	<0.011	<0.012	<0.013	42.7	260	260	260	1030	42.7	693	1350	2200
Naphthalene	<0.0059	<0.0052	<0.0054	<0.0056	<0.0058	<0.0060	<0.0053	<0.0064	<0.0054	<0.0053	<0.0051	<0.0058	<0.0059	<0.0056	<0.0059	<0.0063	52.7	90	450	560	0.511	52.7	330	1670	1050
1,2,4-Trimethylbenzene	<0.0059	<0.0052	<0.0054	<0.0056	<0.0058	<0.0060	<0.0053	<0.0064	<0.0054	<0.0053	<0.0051	<0.0058	<0.0059	<0.0056	<0.0059	<0.0063	5.35	160	220	220	2.34	5.35	86.7	169	275
1,2-Dibromoethane (EDB)	<0.00088	<0.00079	<0.00081	<0.00085	<0.00088	<0.00090	<0.0008	<0.00096	<0.00081	<0.00080	<0.00077	<0.00087	<0.00089	<0.00084	<0.00089	<0.00094	0.154	0.83	4.4	38	0.000982	0.154	0.961	4.86	3.06
1,2-Dichloroethane (EDC)	<0.0059	<0.0052	0.011	<0.0056	<0.0058	<0.0060	<0.0053	< 0.0064	<0.0054	<0.0053	<0.0051	<0.0058	<0.0059	<0.0056	<0.0059	<0.0063	1.01	11	56	480	0.101	1.01	6.33	31.9	20.1
Polynuclear Aromatics																									
Benzo(a)anthracene	<0.0058	<0.0052	<0.0053	0.011	0.019	<0.0059	<0.0052	< 0.0063	0.029	<0.0053	0.014	0.0077	<0.0058	0.0075	<0.0059	0.01	12	12	58	1200	38.1	72800	456000	>1E+6	>1E+6
Benzo(a)pyrene	<0.0058	<0.0052	<0.0053	0.015	0.016	<0.0059	<0.0052	0.007	0.3	<0.0053	0.012	0.012	<0.0058	0.0098	<0.0059	0.014	1.2	1.2	5.8	120	29.2	213000	>1E+6	>1E+6	>1E+6
Benzo(b)fluoranthene	<0.0058	<0.0052	0.014	0.2	0.022	0.0083	0.0061	0.011	0.4	0.0053	0.023	0.016	<0.0058	0.014	<0.0059	0.02	12	12	58	1200	136	>1E+6	>1E+6	>1E+6	>1E+6
Benzo(k)fluoranthene	<0.0058	<0.0052	<0.0053	<0.0055	0.011	<0.0059	<0.0052	<0.0063	0.019	<0.0053	0.0077	<0.0058	<0.0058	<0.0056	<0.0059	<0.0062	120	120	580	12000	1270	>1E+6	>1E+6	>1E+6	>1E+6
Chrysene	<0.0058	<0.0052	0.017	0.02	0.02	0.0085	0.0071	0.011	0.033	<0.0053	0.019	0.016	<0.0058	0.013	<0.0059	0.02	1,200	1200	5800	120000	3870	>1E+6	>1E+6	>1E+6	>1E+6
Dibenz(a,h)anthracene	<0.0058	<0.0052	<0.0053	0.0062	<0.0058	<0.0059	<0.0052	< 0.0063	0.0069	<0.0053	<0.0050	<0.0058	<0.0058	<0.0056	<0.0059	<0.0062	1.2	1.2	5.8	120	46.6	853000	>1E+6	>1E+6	>1E+6
Ideno(1,2,3-cd)pyrene	<0.0058	<0.0052	0.0066	0.012	0.0099	<0.0059	<0.0052	0.0067	0.019	<0.0053	0.014	0.0076	<0.0058	0.0071	<0.0059	0.0099	12	12	58	1200	1020	>1E+6	>1E+6	>1E+6	>1E+6
Naphthalene	<0.0058	<0.0052	0.065	0.038	0.059	0.036	0.007	0.011	0.0055	0.052	0.03	0.057	<0.0058	0.036	<0.0059	0.066	52.7	90	450	560	0.511	52.7	330	1670	1050
Total Petroleum Hydrocarbo	ons (TPHs)																								
TPH (C06-C12)	<1.2	<1	<1.1	<1.1	<1.2	<1.2	<1.1	<1.3	<1.1	<1.1	<1.0	<1.2	<1.2	<1.1	<1.2	<1.3	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
TPH (C10-C20)	<11.5	<10.3	13.2	<11.1	<11.5	<11.8	<10.6	<12.7	<53	<10.4	11.4	<11.5	<11.8	<11.3	<11.7	<12.3	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
ТРН (С20-С34)	<11.5	<10.3	18.2	<11.1	<11.5	<11.8	<10.6	<12.7	<53	<10.4	14.8	<11.5	<11.8	<11.3	<11.7	<12.3	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000

Yellow shading denotes sample removed during soil excavation remediation.

Blue shading denotes detection of analyte.

### Table 1c Soil Concentrations Compared to BUSTR Action Levels

	Addition	nal Tier 1 De	elineation So	oil Bores	Tie	er II Delinea	tion Soil Bo	res					<b>C</b> . 11		6.11.		<b>C</b>
Sample ID	T1MW7	T1MW7	T1MW8	T1MW8	T2SB4	T2SB4	T2SB3	T2SB3	RUCTD	Soil Direct	Soil Direct	Soil Direct	Soil to Drinking	Soil to	Soil to	Soil to	Soil to
Depth	20-22'	34-36'	28-30'	34-36'	22-24'	24-26'	14-16'	26-28'	Delineation	Contact -	Contact - Non-	Excavation	Water	Indoor	Air (Non-	Outdoor	Air (non-
Sampling Date		3/2/	2021			9/22	/2021		Action Level	Residential	Residential	Worker	Leaching	Air (Res)	Res)	Air (Res)	res)
Volatile Organic Compounds (VOCs)								•		•			•	•	•	•	
Benzene	<0.0051	<0.0055	<0.0052	<0.0058	<0.0068	<0.0053	<0.0056	<0.0063	1.67	26	140	1200	0.246	1.67	10.5	52.7	33.2
Ethylbenzene	<0.0051	<0.0055	<0.0052	<0.0058	<0.0068	<0.0053	<0.0056	<0.0063	406	130	480	480	84.5	406	6590	12800	20900
Methyl-tert-butyl ether	<0.0051	<0.0055	<0.0052	<0.0058	<0.0068	<0.0053	<0.0056	< 0.0063	150	1100	5700	8900	1.58	150	940	4740	2990
Toluene	<0.0051	<0.0055	<0.0052	<0.0058	<0.0068	<0.0053	<0.0056	< 0.0063	1,240	820	820	820	70.7	1240	20200	39200	64000
Xylene (Total)	< 0.01	<0.011	<0.01	<0.012	<0.014	<0.011	<0.011	<0.013	42.7	260	260	260	1030	42.7	693	1350	2200
Naphthalene	<0.0051	<0.0055	<0.0052	<0.0058	<0.0068	<0.0053	<0.0056	<0.0063	52.7	90	450	560	0.511	52.7	330	1670	1050
1,2,4-Trimethylbenzene	<0.0051	<0.0055	<0.0052	<0.0058	<0.0068	<0.0053	<0.0056	< 0.0063	5.35	160	220	220	2.34	5.35	86.7	169	275
1,2-Dibromoethane (EDB)	<0.00077	<0.00083	<0.00078	<0.00087	<0.00080	< 0.00063	<0.00066	<0.00075	0.154	0.83	4.4	38	0.000982	0.154	0.961	4.86	3.06
1,2-Dichloroethane (EDC)	<0.0051	<0.0055	<0.0052	<0.0058	<0.0068	<0.0053	<0.0056	<0.0063	1.01	11	56	480	0.101	1.01	6.33	31.9	20.1
Polynuclear Aromatics	-	-								•	•			-		-	
Benzo(a)anthracene	<0.0049	0.0055	0.0075	<0.0056	<0.14	<0.11	<0.11	<0.13	12	12	58	1200	38.1	72800	456000	>1E+6	>1E+6
Benzo(a)pyrene	<0.0049	0.0062	0.008	<0.0056	<0.14	<0.11	<0.11	<0.13	1.2	1.2	5.8	120	29.2	213000	>1E+6	>1E+6	>1E+6
Benzo(b)fluoranthene	<0.0049	0.0081	0.011	<0.0056	<0.27	<0.21	<0.22	<0.25	12	12	58	1200	136	>1E+6	>1E+6	>1E+6	>1E+6
Benzo(k)fluoranthene	<0.0049	<0.0053	<0.0050	<0.0056	<0.27	<0.21	<0.22	<0.25	120	120	580	12000	1270	>1E+6	>1E+6	>1E+6	>1E+6
Chrysene	<0.0049	0.0084	0.013	<0.0056	<0.27	<0.21	<0.22	<.25	1,200	1200	5800	120000	3870	>1E+6	>1E+6	>1E+6	>1E+6
Dibenz(a,h)anthracene	<0.0049	<0.0053	<0.0050	<0.0056	<0.14	<0.11	<0.11	<0.13	1.2	1.2	5.8	120	46.6	853000	>1E+6	>1E+6	>1E+6
Indeno(1,2,3-cd)pyrene	<0.0049	<0.0053	0.005	<0.0056	<0.14	<0.11	<0.11	<0.13	12	12	58	1200	1020	>1E+6	>1E+6	>1E+6	>1E+6
Naphthalene	<0.0049	0.017	0.074	0.0071	<0.27	<0.21	<0.22	<0.25	52.7	90	450	560	0.511	52.7	330	1670	1050
Total Petroleum Hydrocarbons (TF	PHs)																
TPH (C06-C12)	<1	<1.1	<1	<1.2	<2.7	<2.1	<2.2	<2.5	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
TPH (C10-C20)	<10.1	<11	<10.1	<11.3	<20	<16	<17	<19	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
TPH (C20-C34)	<10.1	<11	12.4	<11.3	78.0	42.0	36.0	<19	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000

All results in mg/kg.

Yellow shading denotes sample removed during soil excavation remediation.

Blue shading denotes detection of analyte.

Table 1d Soil Concentrations Compared to BUSTR Action Levels

	BUSTR Closure Assessment Sampling																		
Sample ID														Soil Direct	Soil to				
	T3-S	EW-1	DP-3	DP-4	DD-1	PR-7	DR-2	PR-14	PR-13	PR-3	BUSTR	Soil Direct	Soil Direct	Contact -	Drinking		Soil to	Soil to	
											Delineation	Contact -	Contact - Non-	Excavation	Water	Soil to Indoor	Indoor Air	Outdoor Air	Soil to Outdoor
Sampling Date					7/9/2	2020					Action Level	Residential	Residential	Worker	Leaching	Air (Res)	(Non-Res)	(Res)	Air (non-res)
/olatile Organic Compounds (VOCs)															-		-		
Benzene	<0.0061	<0.006	<0.0053	<0.0051	<0.0057	<0.0058	<0.006	<0.0053	<0.0062	<0.0056	1.67	26	140	1200	0.246	1.67	10.5	52.7	33.2
Toluene	<0.0061	<0.006	<0.0053	<0.0051	0.032	<0.0058	<0.006	<0.0053	<0.0062	<0.0056	1,240	820	820	820	70.7	1240	20200	39200	64000
Ethylbenzene	0.051	<0.006	<0.0053	<0.0051	0.031	<0.0058	<0.006	<0.0053	<0.0062	<0.0056	406	130	480	480	84.5	406	6590	12800	20900
Total Xylenes	0.065	<0.012	<0.011	<0.010	0.19	<0.012	<0.012	<0.011	<0.012	<0.0056	42.7	260	260	260	1030	42.7	693	1350	2200
Naphthalene	5.3	<0.006	<0.210	<0.0051	0.061	0.42	<0.006	<0.0053	<0.0062	<0.0056	52.7	90	450	560	0.511	52.7	330	1670	1050
1,2,4 Trimethyl Benzene	39	<0.006	<0.0053	<0.0051	0.23	<0.0058	<0.006	<0.0053	<0.0062	<0.0056	5.35	160	220	220	2.37	5.35	86.7	169	275
MTBE	<0.0061	<0.006	<0.0053	<0.0051	<0.0057	<0.0058	<0.006	<0.0053	<0.0062	<0.0056	150	1100	5700	8900	1.58	150	940	4740	2990
1,2 - Dibromoethane (EDB)	<0.00072	<0.00071	< 0.00062	< 0.00061	<0.00067	<0.00068	<0.0007	<0.00062	<0.00073	<0.00067	0.154	0.83	4.4	38	0.000982	0.154	0.961	4.86	3.06
1,2 - Dichloroethane (EDC)	<0.0061	<0.006	<0.0053	<0.0051	<0.0057	<0.0058	<0.006	<0.0053	<0.0062	<0.0056	1.01	11	56	480	0.101	1.01	6.33	31.9	20.1
Polynuclear Aromatics (PAHs)		_	-					-	-	-					-		-		-
Benzo (a) Anthracene	<0.120	<0.120	<0.100	<0.100	<0.110	<0.120	<0.120	<0.110	<0.120	4.5	12	12	58	1200	38.1	72800	456000	>1E+6	>1E+6
Benzo (a) Pyrene	<0.240	<0.240	<0.210	<0.210	<0.230	<0.230	<0.240	<0.210	<0.250	5.2	1.2	1.2	5.8	120	29.2	213000	>1E+6	>1E+6	>1E+6
Benzo (b) Fluoranthene	<0.240	<0.240	<0.210	<0.210	<0.230	<0.230	<0.240	<0.210	<0.250	5.5	12	12	58	1200	136	>1E+6	>1E+6	>1E+6	>1E+6
Benzo (k) Fluoranthene	<0.240	<0.240	<0.210	<0.210	<0.230	<0.230	<0.240	<0.210	<0.250	2.1	120	120	580	12000	1270	>1E+6	>1E+6	>1E+6	>1E+6
Chrysene	<0.240	<0.240	<0.210	<0.210	<0.230	<0.230	<0.240	<0.210	<0.250	4.8	1,200	1200	5800	120000	3870	>1E+6	>1E+6	>1E+6	>1E+6
Dibenz (a,h) Anthracene	<0.240	<0.240	<0.210	<0.210	<0.230	<0.230	<0.240	<0.210	<0.250	0.59	1.2	1.2	5.8	120	46.6	853000	>1E+6	>1E+6	>1E+6
Indeno (1,2,3-cd) Pyrene	<0.120	<0.120	<0.100	<0.100	<0.110	<0.120	<0.120	<0.110	<0.120	2.7	12	12	58	1200	1020	>1E+6	>1E+6	>1E+6	>1E+6
Naphthalene	<0.240	<0.240	<0.210	<0.210	<0.230	<0.230	<0.240	<0.210	<0.250	<0.230	52.7	90	450	560	0.511	52.7	330	1670	1050
Total Petroleum Hydrocarbons (TP	PH)	-			-	-		-	-	-	-	-		-	-		-	-	
ТРН (С6-С12)	1,500	<2.4	<2.1	<2.1	210	<2.3	<2.4	<2.1	<2.5	<2.3	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
ТРН (С10-С20)	760	<18	<16	<15	1,700	23	<18	28	<19	<17	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
TPH (C20-C34)	41	<18	19	23	200	21	24	28	21	37	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000

Yellow shading denotes sample removed during soil excavation remediation.

Blue shading denotes detection of analyte.

NA = Not Analysed

Table 1e Soil Concentrations Compared to BUSTR Action Levels

	TIER 2 Comment Response Soil Sampling																		
Sample ID	T2MW11	T2MW11	T2SB1-S	T2SB1-S	T2SB1-E	T2SB1-E	T2SB1-N	T2SB1-N	T2SB1-W	T2SB1-W	BUSTR	Soil Direct	Soil Direct	Soil Direct Contact -	Soil to Drinking	Soil to	Soil to	Soil to	
Depth	22-24'	30-32'	22-24'	26-28'	10-12'	26-28'	22-24"	26-28'	18-20'	32-34'	Delineation	Contact -	Contact - Non-	Excavation	Water	Indoor Air	Indoor Air	Outdoor Air	Soil to Outdoor
Sampling Date	7/9/2020										Action Level	Residential	Residential	Worker	Leaching	(Res)	(Non-Res)	(Res)	Air (non-res)
Volatile Organic Compounds (VOCs)										-									
Benzene	<0.0057	0.27	<0.0058	<0.0060	<0.0058	<0.0058	<0.0054	<0.0054	<0.0054	<0.0057	1.67	26	140	1200	0.246	1.67	10.5	52.7	33.2
Toluene	<0.0057	<0.0057	<0.0058	<0.0060	<0.0058	<0.0058	<0.0054	<0.0054	<0.0054	<0.0057	1,240	820	820	820	70.7	1240	20200	39200	64000
Ethylbenzene	<0.0057	<0.0057	<0.0058	<0.0060	<0.0058	4.5	<0.0054	<0.0054	<0.0054	<0.0057	406	130	480	480	84.5	406	6590	12800	20900
Total Xylenes	<0.011	<0.011	<0.012	<0.012	<0.012	7.5	<0.011	<0.011	0.016	<0.011	42.7	260	260	260	1030	42.7	693	1350	2200
Naphthalene	<0.0057	<0.0057	<0.0058	<0.0060	0.011	7.2	<0.0054	<0.0054	<0.0054	<0.0057	52.7	90	450	560	0.511	52.7	330	1670	1050
1,2,4 Trimethyl Benzene	<0.0057	<0.0057	<0.0058	<0.0060	0.0096	54	<0.0054	<0.0054	0.0089	<0.0057	5.35	160	220	220	2.37	5.35	86.7	169	275
MTBE	<0.0057	<0.0057	<0.0058	<0.0060	<0.0058	<0.0058	<0.0054	<0.0054	<0.0054	<0.0057	150	1100	5700	8900	1.58	150	940	4740	2990
1,2 - Dibromoethane (EDB)	<0.00064	<0.00064	<0.00065	<0.00067	<0.00065	<0.00068	<0.00060	<0.00061	<0.00060	<0.00064	0.154	0.83	4.4	38	0.000982	0.154	0.961	4.86	3.06
1,2 - Dichloroethane (EDC)	<0.0057	0.012	<0.0058	<0.0060	<0.0058	<0.0058	<0.0054	<0.0054	<0.0054	<0.0057	1.01	11	56	480	0.101	1.01	6.33	31.9	20.1
Polynuclear Aromatics (PAHs)																			
Benzo (a) Anthracene	<0.110	<0.110	<0.120	<0.120	<0.120	<0.120	<0.110	<0.110	<0.110	<0.110	12	12	58	1200	38.1	72800	456000	>1E+6	>1E+6
Benzo (a) Pyrene	<0.230	<0.230	<0.230	<0.240	<0.230	<0.230	<0.220	<0.220	<0.210	<0.230	1.2	1.2	5.8	120	29.2	213000	>1E+6	>1E+6	>1E+6
Benzo (b) Fluoranthene	<0.230	<0.230	<0.230	<0.240	<0.230	<0.230	<0.220	<0.220	<0.210	<0.230	12	12	58	1200	136	>1E+6	>1E+6	>1E+6	>1E+6
Benzo (k) Fluoranthene	<0.230	<0.230	<0.230	<0.240	<0.230	<0.230	<0.220	<0.220	<0.210	<0.230	120	120	580	12000	1270	>1E+6	>1E+6	>1E+6	>1E+6
Chrysene	<0.230	<0.230	<0.230	<0.240	<0.230	<0.230	<0.220	<0.220	<0.210	<0.230	1,200	1200	5800	120000	3870	>1E+6	>1E+6	>1E+6	>1E+6
Dibenz (a,h) Anthracene	<0.230	<0.230	<0.230	<0.240	<0.230	<0.230	<0.220	<0.220	<0.210	<0.230	1.2	1.2	5.8	120	46.6	853000	>1E+6	>1E+6	>1E+6
Indeno (1,2,3-cd) Pyrene	<0.110	<0.110	<0.120	<0.120	<0.120	<0.120	<0.110	<0.110	<0.110	<0.110	12	12	58	1200	1020	>1E+6	>1E+6	>1E+6	>1E+6
Naphthalene	<0.230	<0.230	<0.230	<0.240	<0.230	4.6	<0.220	<0.220	<0.210	<0.230	52.7	90	450	560	0.511	52.7	330	1670	1050
Total Petroleum Hydrocarbons (TF	PH)	_		_		-	_		-	-		-							
ТРН (С6-С12)	<2.3	<2.3	<2.3	<2.4	5.9	980	5.4	2.3	2.6	<2.3	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
ТРН (С10-С20)	<17	18	100	<18	<17	410	<16	<16	16	22	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
ТРН (С20-С34)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000

Yellow shading denotes sample removed during soil excavation remediation.

Blue shading denotes detection of analyte.

NA = Not Analysed

## CONTRACT FOR EXCAVATION

### STARK COUNTY LAND REUTILIZATION CORPORATION

With\_\_\_\_\_

Dated

PROJECT: Excavation and remediation of the former Columbus Road Starfire Gas Station, located at 2433 Columbus Road N.E., Canton, Ohio 44705

This CONTRACT made and entered into at Canton, Ohio, on \_\_\_\_\_\_ by the

Stark County Land Reutilization Corporation, hereinafter referred to as "LAND BANK", and

hereinafter referred to as "CONTRACTOR".

WITNESSETH, the Land Bank, and the Contractor hereby agree as follows:

## 1. <u>CONTRACT DOCUMENTS</u>

The Contract consists of this document, the Notice to Bidders, Instruction to Bidders, Format for Bid Submission, Bid Sheet, List of Subcontractors, Contractor's Affidavits, Bidder's Profile/Qualifications, Bid Guaranty, the Performance Bond, the Contractor's Bid, the Bid Specifications, Scope of Work, all Addenda issued prior to execution of this Contract, and all Change Orders issued subsequent thereto, if any; and when specified: Equal Opportunity Requirements, Prevailing Wage Rate Requirements, and Federal and/or State Regulations. All of the foregoing are incorporated herein by reference.

# 1.1. CONTRACT REGULATIONS

Terms and conditions of this Contract shall be governed by the provisions of Chapters 153 and 4115 and Section 149.53 of the Ohio Revised Code, and all applicable local, State and Federal Ordinances, Statues and Regulations.

All records, manuals, forms, drawings, schedules, lists, surveys, specifications, designs, and other data pertaining to the work specified in this contract are and shall remain the sole property of the Land Bank. The use of any Subcontractor must be reported to the Land Bank and shall be bound by the same requirements as the Contractor.

All employees of the Contractor and the Subcontractors who are assigned to work on this project shall be paid the current Prevailing Wage Rates as issued by the State of Ohio rules and regulations. Weekly certified payroll shall be submitted to the Land Bank according to regulations.

### 2. <u>THE WORK</u>

The Contractor shall provide all necessary materials, insurance, tools, equipment, and all utility and transportation services and perform all labor necessary to complete, in a satisfactory manner all the work for the excavation of clean overburden and petroleum contaminated soils at the Former Columbus Road Starfire Gas Station located at 2433 Columbus Road N.E., Canton, Ohio 44705 in strict accordance with the plans, specifications, Scope of Work, addendums, and Bid documents on file in the office of the Land Bank.

The Contractor shall proceed in a prompt and diligent manner to complete the Project in such order as the Land Bank may direct, and shall execute, construct, finish, and test when required, the Project, in an expeditious, substantial and workmanlike manner to the satisfaction of the Land Bank, and to the final acceptance of the Project by the Land Bank.

The Contractor represents and warrants that it has fully inspected the premises, and that the Scope of work as prescribed herein is based upon said actual on-site inspection by Contractor. Contractor acknowledges that the Work is being done for the purpose of reutilization of the Site.

The Contractor represents and warrants that all agents, subcontractors and employees are fully licensed, certified or otherwise authorized to complete all aspects of the scope of work listed in the project specifications.

If any governmental authority, the Land Bank, or its agent identifies unsatisfactory, defective, incomplete, or unworkmanlike work in the scope of Contractor's services herein, Contractor will, upon notice from the Land Bank or such person, company or governmental unit,

immediately stop said work and immediately commence compliance with such notice and immediately correct such problem at Contractor's expense.

#### 3. TIME OF COMMENCEMENT AND COMPLETION

The Contractor shall commence work upon notice from the Land Bank to proceed.

The Contractor shall complete the Project work within thirty (30) consecutive calendar days after receipt of notice to proceed. Unless caused by forces beyond its/his/her control, the Contractor shall pay the Land Bank <u>\$500.00</u> for each and every calendar day the Project is delayed beyond the date fixed for completion.

#### 4. <u>CONTRACT SUM</u>

The Contractor shall be paid the sum of \_\_\_\_\_\_ for the work performed.

The price herein shall remain fixed. No other charges, extras or additions shall be made or added to this Contract unless first agreed to in writing by the Land Bank. Any work performed or extras outside the Scope of Work herein without the Land Bank's prior written approval shall be at the Contractor's sole cost and expense.

### 5. <u>PAYMENTS</u>

The Land Bank shall make payments on account of the Contract Sum to the Contractor as provided in Chapter 153 of the Ohio Revised Code.

In order to receive payment Contractor must submit an invoice and Certified Payroll, completed in their entirety, and submit all documents specifically referenced therein.

### 6. <u>NEGLECT, DEFAULT, DELAY, ETC.</u>

The Land Bank shall not be liable to the Contractor for any neglect, default, delay, or interference of or by another Contractor, nor shall any such neglect, default, delay, or interference of or by any other Contractor, or alteration which may be required in said Work, release the Contractor from the obligation to finish the said Work within the time aforesaid, or from the damage to be paid in default thereof.

### 7. INSURANCE INDEMNIFICATION AND WORKERS COMPENSATION

The Insurance, Indemnification, and Worker's Compensation Specifications for Contractors and their Subcontractors are attached as Exhibit "A", which Exhibit is incorporated herein by reference and made a part hereof the same as though rewritten herein in full.

#### 8. FAILURE TO COMPLY

If the CONTRACTOR shall fail to comply with any of the terms, conditions, provisions or stipulations of this Contract, the Land Bank may avail itself of any and all remedies provided on their behalf in the Contract, and shall have the right and power to proceed in accordance with the provisions thereof, and, in addition, generally, in a court of law seek relief in damages or other appropriate relief as a result of the Contractor's failure to comply.

## 9. <u>RESOLUTION OF DISPUTES</u>

In the event of a dispute covering additional costs, claims and any other matter arising out of or relating to this Contract, or the breach thereof, such disputes shall be decided by submission to a court of competent jurisdiction within Stark County Ohio within one (1) year of the date upon which the Land Bank accepts and approves the project for use. The Contractor hereby waives any right to rely upon the statute of limitations for actions on contracts.

Failure to bring an action within one year of the above date shall constitute a bar to such action. If, however, within ten (10) days of the specific event giving rise to the disputed matter, the Contractor gives the Land Bank, by written notice, a request to submit the matter to arbitration, the Land Bank and the Contractor may agree, within sixty (60) days of receipt of the above notice, to submit the matter to arbitration as set forth below.

If the parties agree, by written change order signed by the Land Bank and the Contractor, to submit such dispute to arbitration, all proceedings shall be according to Ohio Revised Code Chapter 2711., and, unless waved, the Ohio Rules of Civil Procedure and the Ohio Rules of Evidence. The Land Bank and the Contractor shall each choose on arbitrator. The two arbitrators shall agree upon and choose a third arbitrator, who shall preside over the proceedings.

Compensation of the arbitrators shall be as agreed upon by the Land Bank, the Contractor and the arbitrators. Payment for the arbitrators shall be shared equally by the Land Bank, and the Contractor. The Contractor shall deposit, as a precondition to commencement of the hearing, its equal share of the compensation of the arbitrators with the Land Bank to be placed in an account for that purpose, or with an escrow agent suitable to both parties.

The hearing or the arbitration shall commence within sixty (60) days of the agreement to arbitrate. If the hearing is not commenced within sixty (60) days of the agreement to arbitrate, said agreement shall be void and the dispute shall be resolved by submission to a court of competent jurisdiction as herein before specified.

The award rendered by the arbitrators shall be a non-binding recommendation unless the parties agree in writing prior to the arbitration that it be binding. If agreed upon to be binding, the decision once final may be entered into any court of competent jurisdiction as a final judgment.

All questions with regard to the rights and authority of the arbitration panel shall be resolved pursuant to Chapter 2711., of the Revised Code of Ohio.

#### 10. IN FORCE AND EFFECT

Subject to the applicable provisions of law, this contract shall be in full force and effect from and after the date when a fully executed and approved counterpart hereof is forwarded to the Contractor, but the Contractor shall not start work on the Project until written notification to proceed is received from the Land Bank.

#### 11. EQUAL EMPLOYMENT OPPORTUNITY

In performing any contract, both the Land Bank and the Contractor shall not discriminate against any employee, applicant for employment, or other person because of race, religion, color, sex, national origin, disability, age, military status, or ancestry. The Land Bank and the Contractor will take affirmative action to ensure that applicants are employed and that employees are treated

during their employment without regard to race, religion, color, sex, national origin, disability, age, military status, or ancestry.

Except in contracts exempted in accordance with Section 204 of the Executive Order, all Government contracting agencies shall include in every Government contract hereafter entered into the following provisions:

"During the performance of this contract, the Contractor agrees as follows:

"(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of the nondiscrimination clause.

"(2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

"(3) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a

notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the Contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of this notice in conspicuous places available to employees and applicants for employment.

"(4) The Contractor will comply with all provisions of Executive Order No. 11246 of September24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

"(5) The Contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

"(6) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be cancelled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order No. 11246 of September 24, 1965, or by rule regulation, or order of the Secretary of Labor, or as otherwise provided by law.

"(7) The Contractor will include the provisions of Paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each Subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the contracting agency may direct as a means of enforcing such provisions, including sanctions for noncompliance; provided, however, that in the event the Contractor becomes involved in, or is threatened with, litigation with a Subcontractor or vendor as a result of such direction by the contracting agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States."

# 12. NON-ASSIGNMENT OF CONTRACT

The Contractor shall not assign or transfer any interest in this Contract to any other party without the express written consent of the Land Bank.

	NESS WHEREOF, the Land E	sank and the Contractor and their signatures:
WITNESS:		STARK COUNTY LAND REUTILIZATION CORPORATION
		By: Alexander A. Zumbar, Chairman
		By: Robert A. Nau, President
WITNESS:		CONTRACTOR:
		Ву:
		Name, Title
WITNESS:		
Contrac	tor to complete applicable par	ragraph below:
	A Corporation organized under to do business in the State of	er the Laws of and qualified Ohio.
	Co-partners trading and doing	g business under the firm name and style of
	List names of all Partners Or Joint Venture Participants	
	An individual doing business	under the firm name and style of

IN WITNESS WHEREOF, the Land Bank and the Contractor affix their signatures:

APPROVED AS TO FORM AND CONTENT:

John F. Anthony Attorney at Law

# EXHIBIT "A" TO CONTRACT

Dated

INSURANCE SPECIFICATIONS FOR CONTRACTORS AND SUBCONTRACTORS AT ANY TIER

These Specifications are incorporated in and are a part of the Contract and shall be attached as Exhibit "A".

The Contractor, all Subcontractors, and all Sub-Subcontractors (all hereinafter called the "Contractor") shall provide and maintain during the life of this Contract the following minimum insurance, limits, and conditions:

## **INSURANCE**

The Contractor, all Subcontractors, and all Sub-Subcontractors (all hereinafter called the "Contractor") shall provide and agrees to maintain during the life of this Contract Pollution Liability coverage of \$1 million per occurrence, Stop Gap Liability insurance coverage of \$1 million per occurrence, and Automotive Liability Insurance coverage of \$1 million per occurrence. If automotive liability coverage amounts are insufficient, the insufficiency can be made sufficient by umbrella liability coverage in the amount of or greater than the insufficiency.

Contractor agrees to add the Stark County Land Reutilization Corporation (SCLRC), 201 3rd Street NE, Suite 201, Canton, Ohio 44702 and PANDEY Environmental, LLC, 6277 Riverside Drive, Dublin, OH 43017 as a "Certificate Holder." A copy of the "Certificate of Liability Insurance" reflecting the required coverage's, and verifying SCLRC and PANDEY Environmental, LLC as a "Certificate Holder" is required.

The SCLRC and PANDEY Environmental, LLC must also be named as an "Additional Insured" on the General Liability, Auto and Pollution coverage's. A copy of the Additional Insured endorsement CG2010(10/01) or CG2037(10/01) a blanket endorsement or their equivalent must be attached to the Certificate. In addition, the "Cancellation Section" of the Certificate must be amended to read as follows: "Should any of the above described policies be cancelled before the expiration date thereof, the issuing insurer will mail a 30 days written notice to the certificate holder named to the left."

These Insurance Specifications apply equally to all subcontractors and sub-subcontractors at any tier during the period of their work on the project.

The Prime Contractor shall be solely responsible for their subcontractor's liability if they permit the Sub to work on the project without the Sub having been issued a Notice to Proceed by the Land Bank.

# NOTICE REQUIREMENT

All insurance policies and certificates shall include an endorsement providing 30 days prior written notice to the Land Bank of cancellation, policy lapse, material change or reduction of coverage. The Contractor shall cease operations on the occurrence of any such cancellation, policy lapse, material change, or reduction, and shall not resume operations until new insurance is in force, and a new Certificate of Insurance is filed with and approved by the County, and he is again authorized to proceed.

Such cessation of operations shall not excuse the Contractor's obligation to complete his work within the time specified in this contract.

## **INDEMNIFICATION**

The Contractor agrees to indemnify and hold the Land Bank, its officials, officers, agents, and employees harmless from any and all losses, claims, actions, costs, expenses, judgments, subrogations, or other damages resulting from injury to any person (including injury resulting in death), or damage (including loss or destruction) to property of whatsoever nature of any person, firm, or corporation arising out of the errors, omissions or negligent acts of the Contractor in the performance of the terms of this Contract by the Contractor, including but not limited to the Contractor's employees, agents, subcontractors, sub-subcontractors, and others designated by the Contractor to perform work or services in, about, or attendant to, the work and services under the terms of this contract.

# WORKER'S COMPENSATION

The Contractor, all Subcontractors, and all Sub-Subcontractors agrees to maintain statutory worker's compensation coverage as required by law, and comprehensive general insurance coverage of \$2 million per occurrence. If comprehensive general and/or automotive liability coverage amounts are insufficient, the insufficiency can be made sufficient by umbrella liability coverage in the amount of or greater than the insufficiency. Subcontractor agrees to provide current Worker's Compensation and Liability Insurance verification with this signed contract.