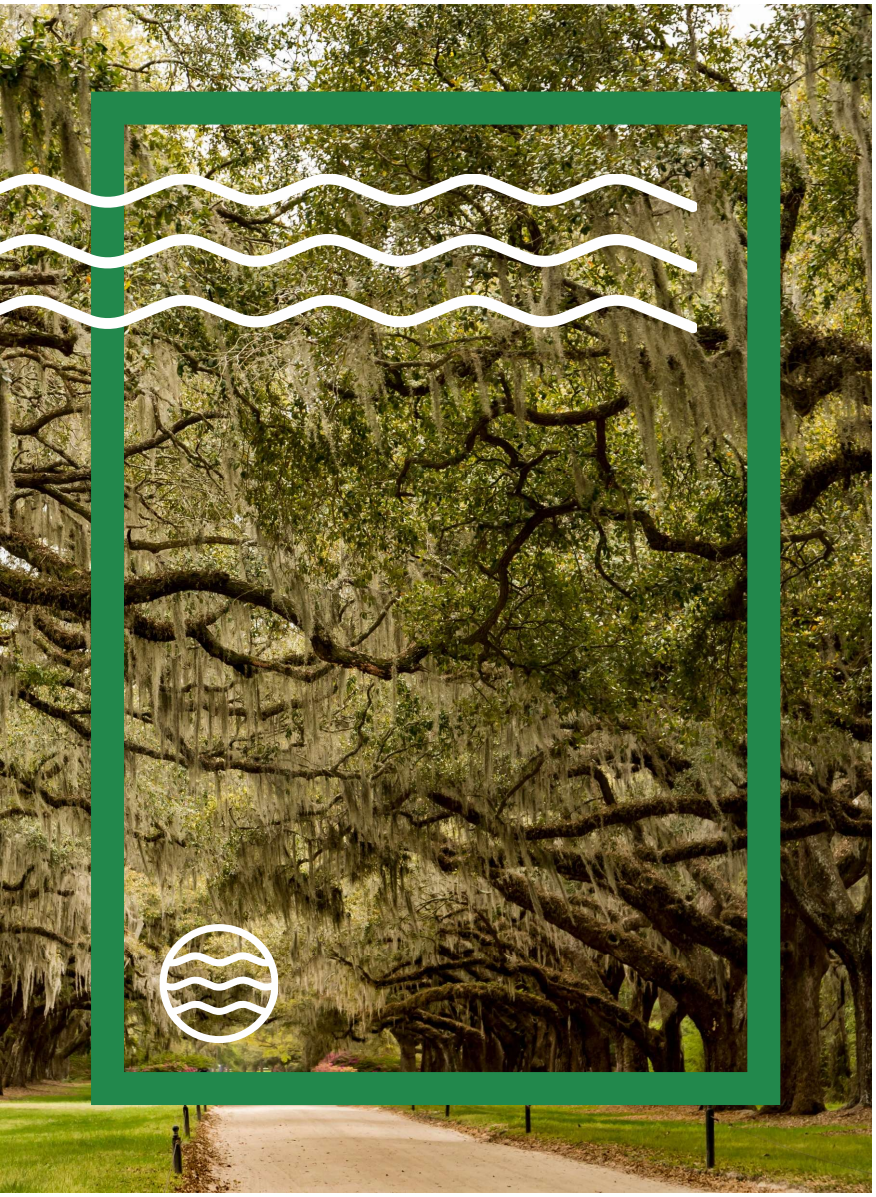
SC DEPARTMENT *of* ENVIRONMENTAL SERVICES

Former Shakespeare Composite Structures Site

March 11, 2025



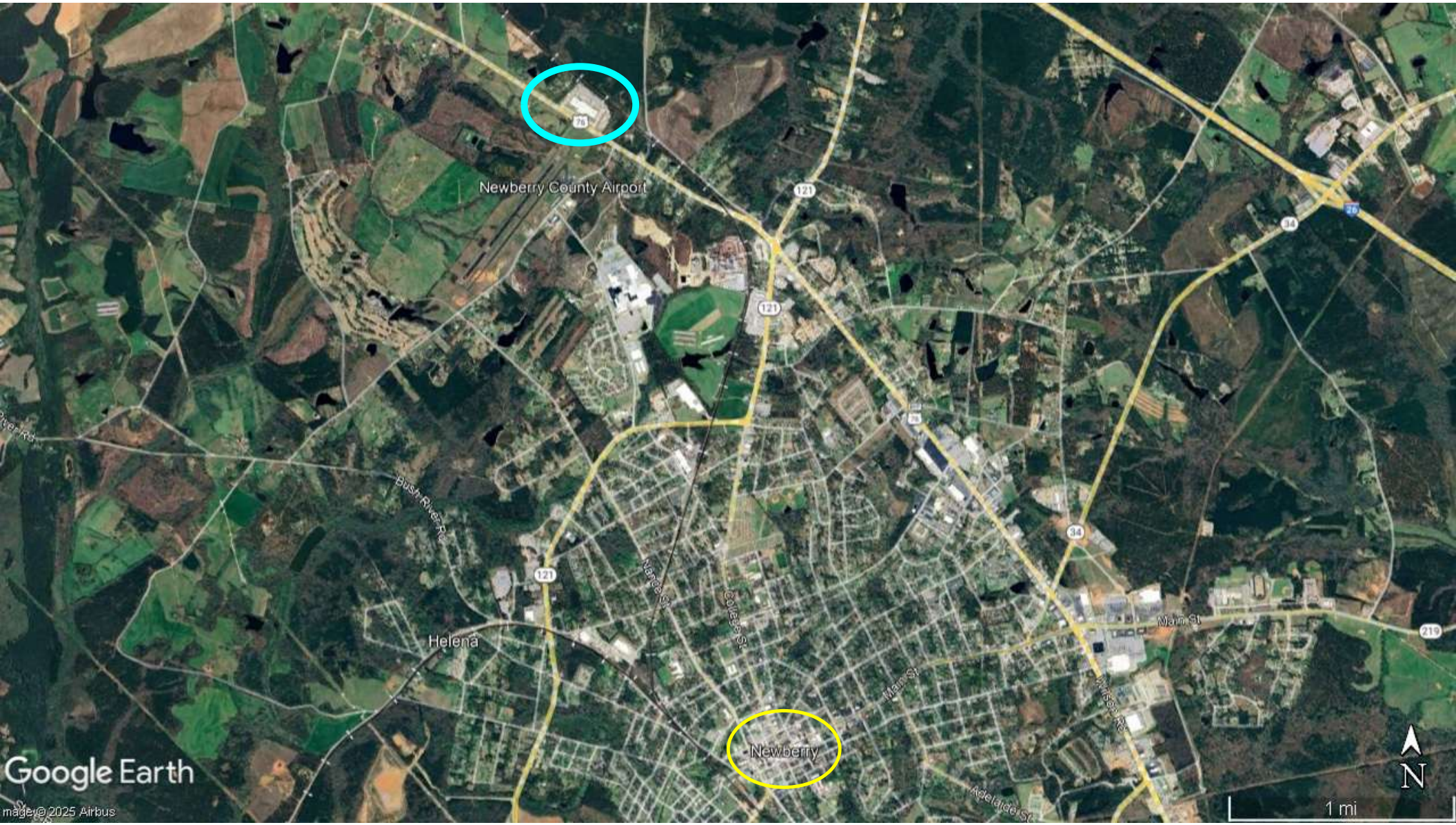
Agenda

- Site History
- Feasibility Study and Proposed Plan
- Proposed Plan Alternatives
- Evaluation of Alternatives
- SCDES's Preferred Alternative
- Public Comment Period

Site History

A brief overview

SC DES


Newberry County Airport
Helena
Newberry
Bush River Rd
Main St
Google Earth
mage © 2025 Airbus
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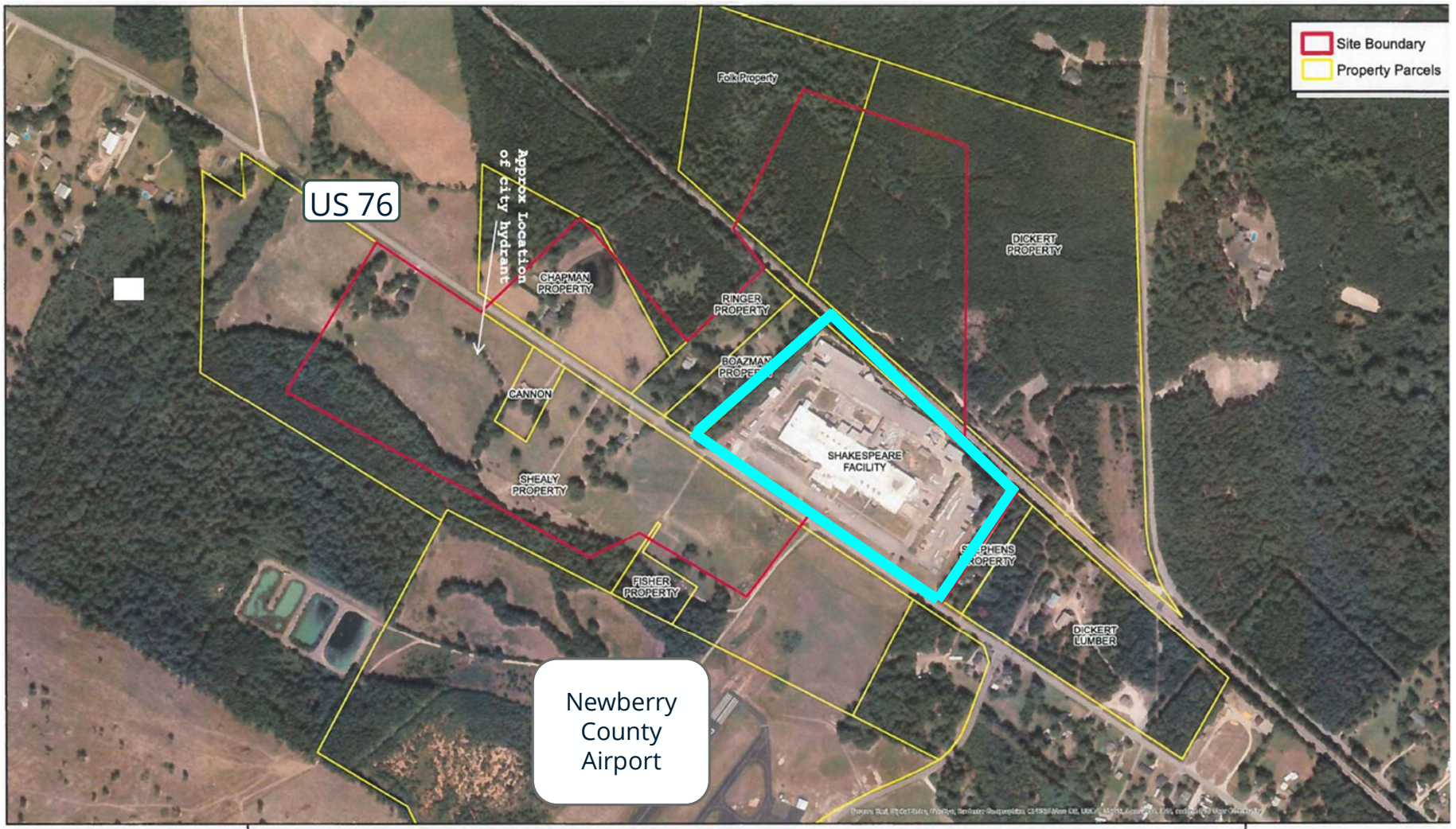


AECOM

101 Research Drive
Columbia, SC 29203-9389
T: (803) 254-4400 F: (803) 771-6676

Figure 1-2: Site Plan

Shakespeare Composition Structures
Newberry, South Carolina

Project No.: 60635197; Prepared by: KA; Date: 09/10/20

N W E S

0 225 450 90

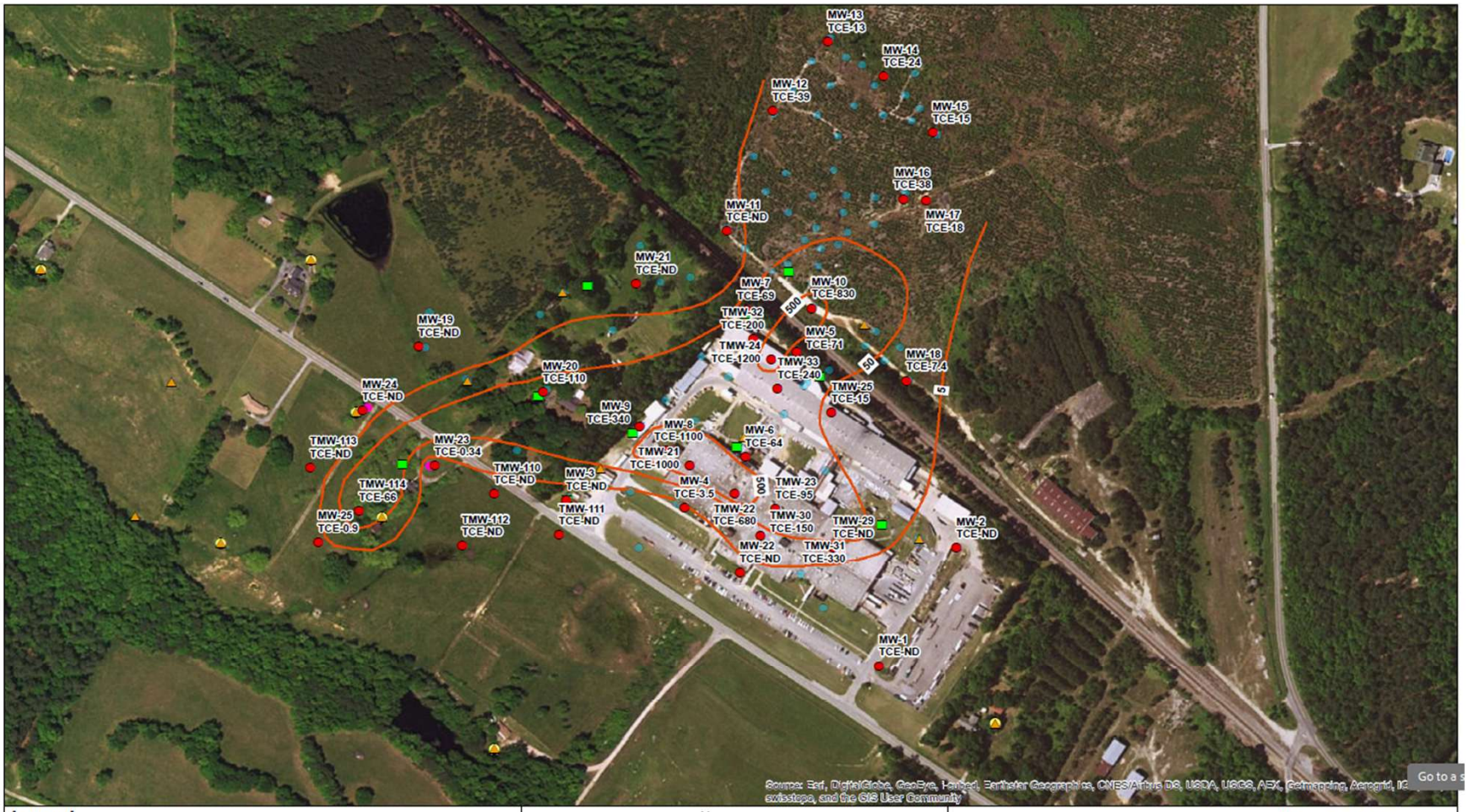
A very rough timeline…

Chemicals of Concern

Chemical of Concern	Maximum Contaminant Level (MCL) for Groundwater
PCE (tetrachloroethene)	5 µg/L or 5 ppb
TCE (trichloroethene)	5 µg/L or 5 ppb
Cis – 1,2 DCE (cis-1,2-dichloroethene)	70 µg/L or 70 ppb
VC (vinyl chloride)	2 µg/L or 2 ppb

Important Areas

- Main Building
- West of the Main Building
- Pole Winder Building
- North of the Site, near the train tracks



Legend

- Shallow Well
- Intermediate Well
- Bedrock Well
- Water Supply Well
- Existing Shallow Zone Monitoring Well
- Abandoned Temporary Wells
- TCE Isoconcentration Contour (ug/L)

TCE-15: Trichloroethene concentration 15 ug/L.
ND: Non detected.
NS: Not sampled.

N
W E
S

0 300 600 900

Feet

G:\Projects\Active\60328308_Shakespeare\map\Shallow_TCE.mxd

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Figure 1: TCE Isoconcentration in Shallow Zone

Shakespeare Composition Structures
Newberry, South Carolina

Project No.: 60328308; Prepared by: JC; Date: 5/17/2016.

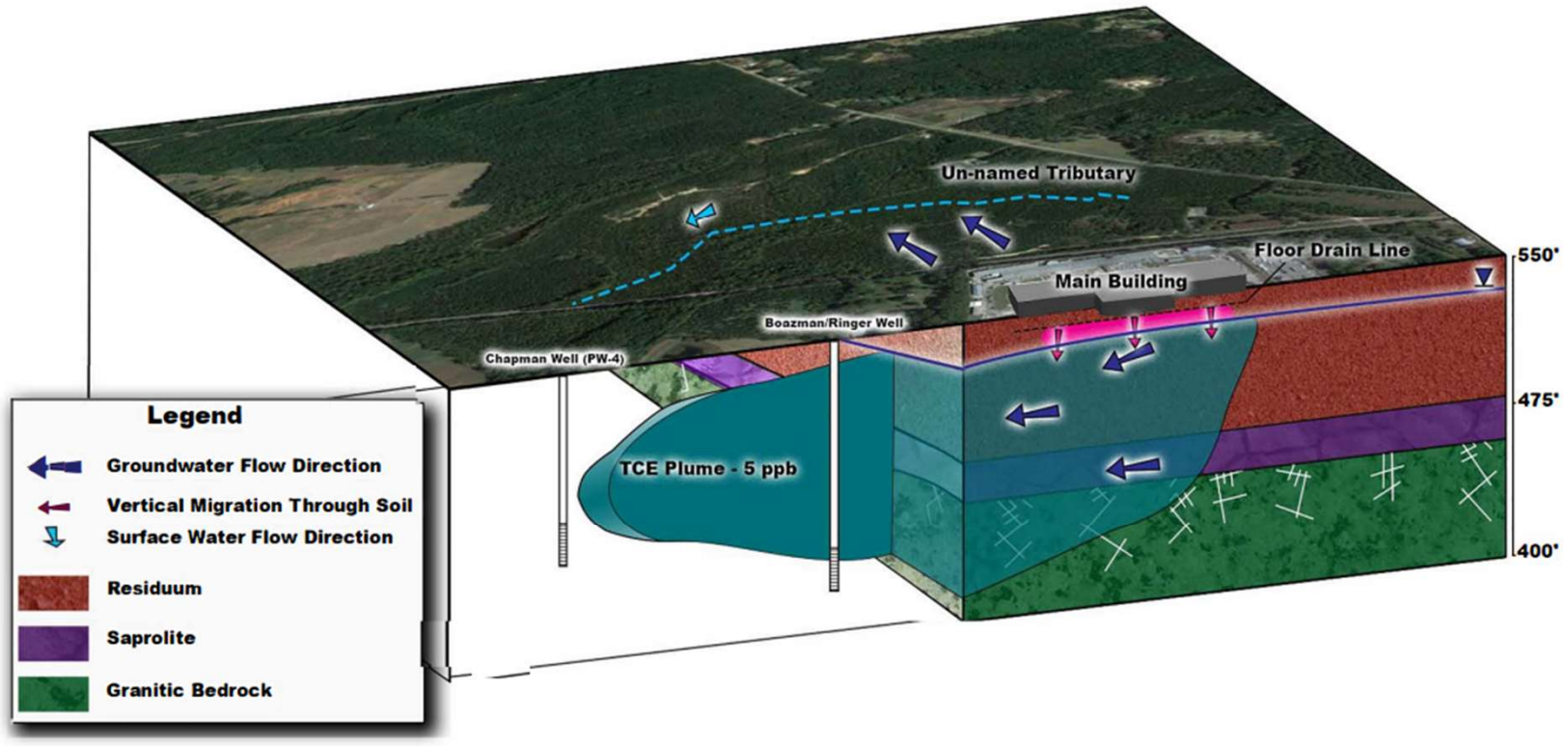

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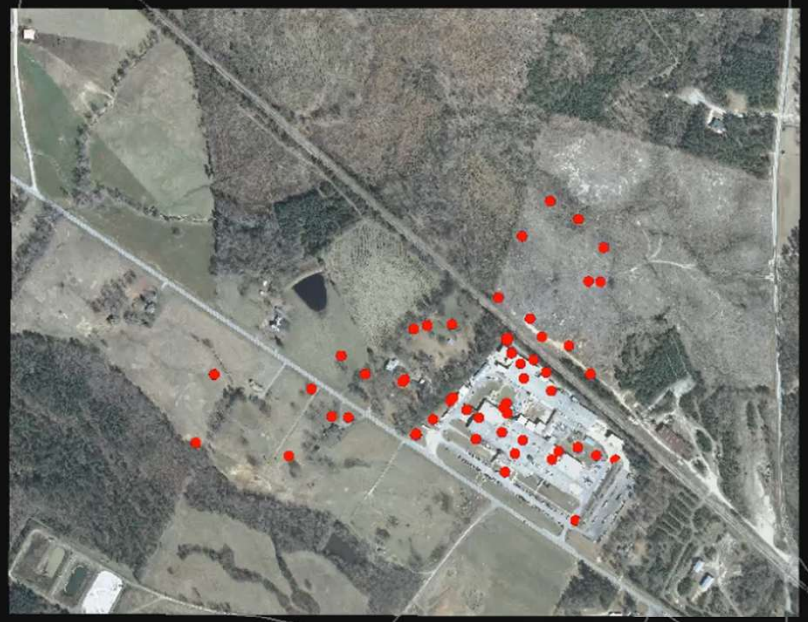
Figure 3-7: Conceptual Site Model

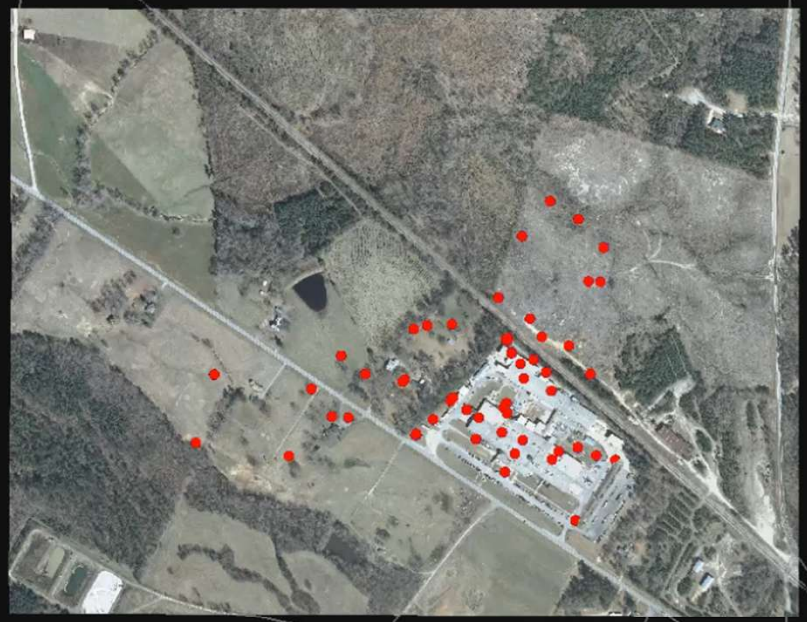
Shakespear Composition Structures
Newberry, South Carolina

Project No.: 60721186; Date: 8/20/2018

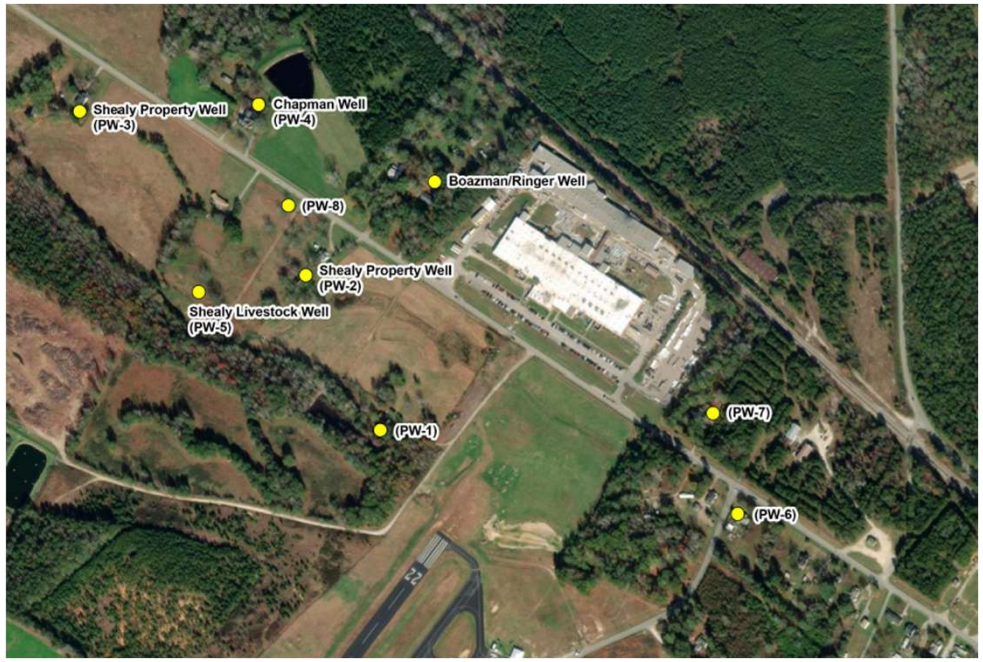
TCE in Groundwater - Shakespeare
Newberry, SC



TCE in Groundwater - Shakespeare
Newberry, SC



Risks of Contamination



- Soil
- Vapor Intrusion
- Groundwater

Feasibility Study and Proposed Plan

SC DES

Superfund Process

Feasibility Study

Remedial Action Objectives (RAOs)

- Control, reduce, or eliminate incidental ingestion and direct contact of groundwater with VOCs at concentrations exceeding MCLs by human receptors.
- Control, reduce, or eliminate leaching of VOCs from soil to groundwater which would result in exceedance of groundwater MCLs.
- Control, reduce, or eliminate inhalation of soil vapor containing VOCs at concentrations exceeding the USEPA Industrial RSLs by human receptors.
- Restore groundwater to drinking level standards at areas not under land use restrictions.

Proposed Plan Alternatives

Proposed Plan Alternatives

5 Alternatives

- 2 Passive; 3 Active
- All are theoretical.
- After a remedy is selected, a Remedial Design Work Plan will be submitted to SCDES for *review and approval.*

Alternative 1

No Action

- This alternative maintains the site as-is.
- Cost: $0

Alternative 2

Monitored Natural Attenuation (MNA), Institutional Controls (IC), and Containment via Cover (CvC)

- This alternative involves monitoring the current well network, restrictions on land and groundwater use, and maintenance of the buildings' floors.
- Cost: $1,137,000 over a 30-year period.

Remediation Technologies

In Situ **Injection Events** **Time**

Common name:				
What does it do?				
Challenges:				

Remediation Technologies

In Situ **Injection Events** **Time**

	In Situ Chemical Oxidation			
Common name:	ISCO			
What does it do?	Chemical oxidants used to transform CVOCs into less toxic forms.			
Challenges:	Oxidant gets used up quickly, multiple injections. Hard to reach places. Even applications.			

Remediation Technologies

In Situ **Injection Events** **Time**

	In Situ Chemical Oxidation	In Situ Chemical Reduction		
Common name:	ISCO	ISCR		
What does it do?	Chemical oxidants used to transform CVOCs into less toxic forms.	Chemical reductants to transform CVOCs into less toxic forms.		
Challenges:	Oxidant gets used up quickly, multiple injections. Hard to reach places. Even applications.	Hard to reach places. Even application.		

Remediation Technologies

In Situ **Injection Events** **Time**

	In Situ Chemical Oxidation	In Situ Chemical Reduction	In Situ Enhanced Reductive Dechlorination	
Common name:	ISCO	ISCR	ISERD	
What does it do?	Chemical oxidants used to transform CVOCs into less toxic forms.	Chemical reductants to transform CVOCs into less toxic forms.	Enhancing natural anaerobic degradation with carbon food source and chemical reduction agents. ISAB + ISCR	
Challenges:	Oxidant gets used up quickly, multiple injections. Hard to reach places. Even applications.	Hard to reach places. Even application.	Will need a pH buffer to support microbes.	

Remediation Technologies

In Situ **Injection Events** **Time**

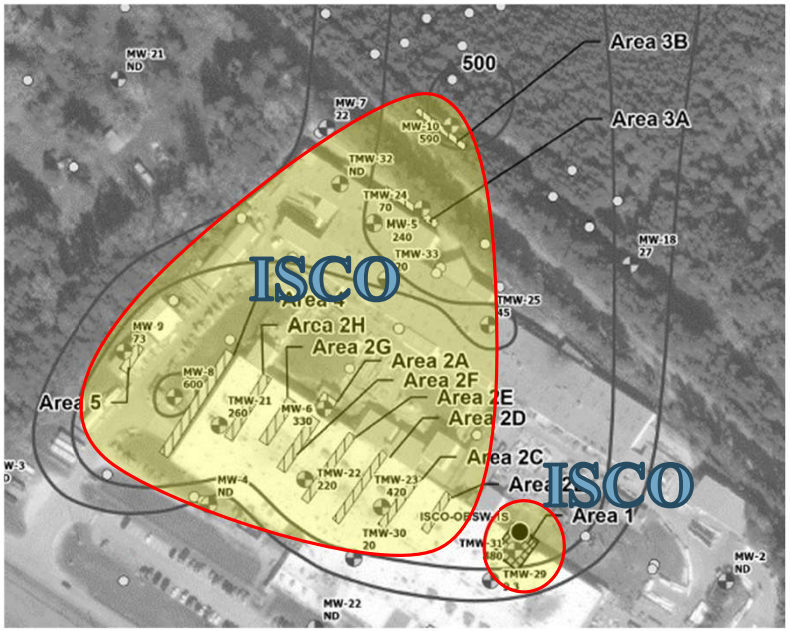
	In Situ Chemical Oxidation	In Situ Chemical Reduction	In Situ Enhanced Reductive Dechlorination	In Situ Adsorption
Common name:	ISCO	ISCR	ISERD	ISA
What does it do?	Chemical oxidants used to transform CVOCs into less toxic forms.	Chemical reductants to transform CVOCs into less toxic forms.	Enhancing natural anaerobic degradation with carbon food source and chemical reduction agents. ISAB + ISCR	A binder is introduced to reduce mobility. Provides a matrix for microorganisms. Colloidal or powered activated carbon.
Challenges:	Oxidant gets used up quickly, multiple injections. Hard to reach places. Even applications.	Hard to reach places. Even application.	Will need a pH buffer to support microbes.	Hard to reach places, soil fracturing could be required.

Alternative 3

In Situ Chemical Oxidation (ISCO), Monitored Natural Attenuation (MNA), Institutional Controls (IC), and Containment via Cover (CvC)

Cost: $2,653,000 over a 30-year period.

Alternative 3

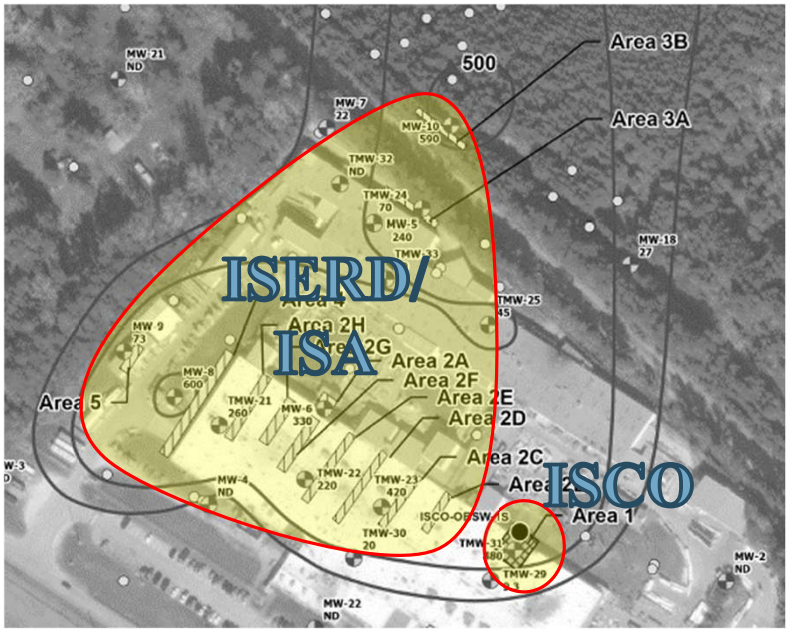


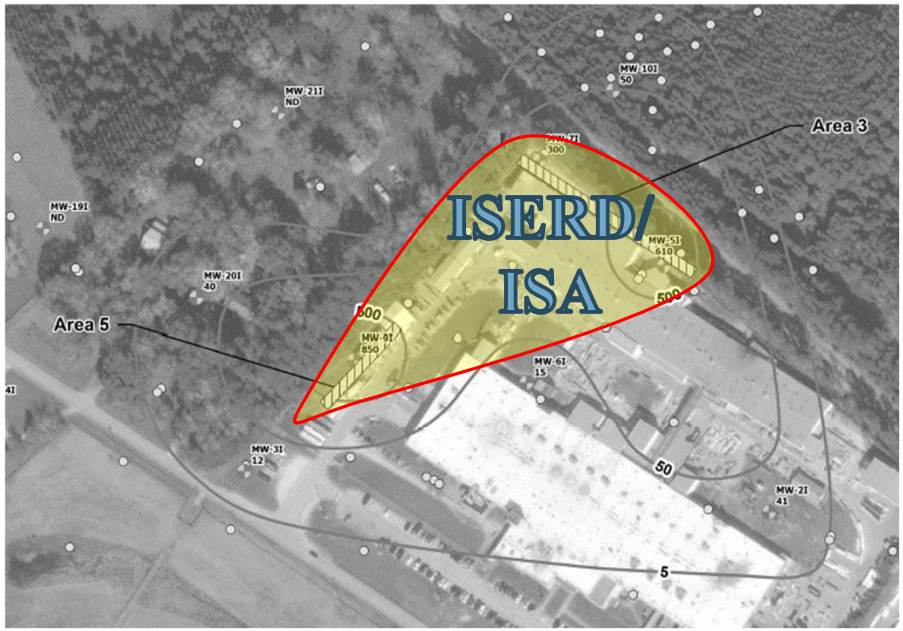
Alternative 4

In Situ Chemical Oxidation (ISCO), In Situ Enhanced Reductive Dechlorination (ISERD), In Situ Adsorption (ISA), Monitored Natural Attenuation (MNA), Institutional Controls (IC), and Containment via Cover (CvC)

Cost: $3,052,000 over a 30-year period.

Alternative 4



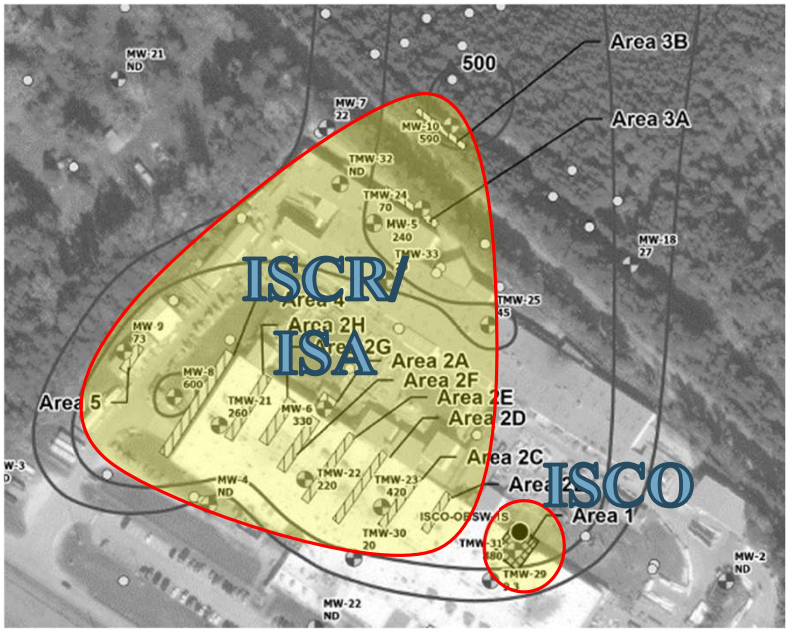


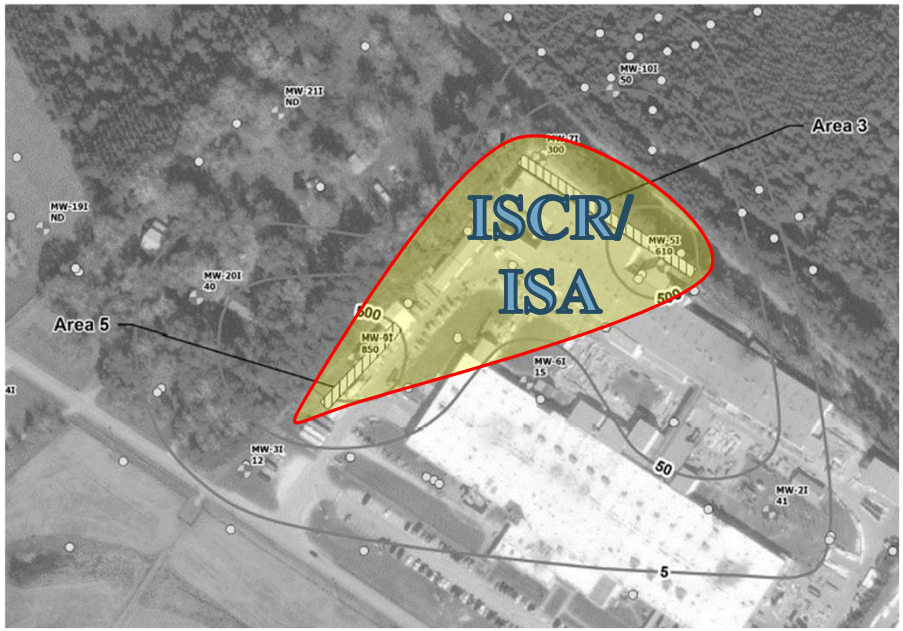
Alternative 5

In Situ Chemical Oxidation (ISCO), In Situ Chemical Reduction (ISCR), In Situ Adsorption (ISA), Monitored Natural Attenuation (MNA), Institutional Controls (IC), and Containment via Cover (CvC)

Cost: $2,393,000 over a 30-year period.

Alternative 5





Evaluation of Alternatives

Threshold Criteria

Overall protection of human health and the environment.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

- Staying compliant with federal and state environmental statues and regulations. Any permits needed to implement the remedy.

Balancing Criteria

Short-term effectiveness

- Risks to on-site workers, the community, or the environment during implementation.

Long-term effectiveness and permanence

- How permanent the remediation is, and what are the long-term risks.

Reduction of toxicity, mobility & volume through treatment

- Does the remedy address the toxicity, mobility, and volume, especially in the source areas.

Implementability

- Is the remedy feasible.

Costs

Criterion	Alternative 1 No Action	Alternative 2 MNA, IC & CvC	Alternative 3 ISCO, MNA, IC & CvC	Alternative 4 ISCO, ISERD, ISA, MNA, IC & CvC	Alternative 5 ISCO, ISCR, ISA, MNA, IC & CvC
Protection Human Health and the Environment	1	3	4	4	4
Compliance with ARARs	1	2	3	3	3
Short-Term Effectiveness	1	2	4	3	5
Long-Term Effectiveness and Permanence	1	2	3	3	4
Reduction of toxicity, mobility, & volume	2	2	3	4	4
Implementability	5	4	4	3	4
Costs	$0	$1,137,000	$2,653,000	$3,052,000	$2,393,000
	5	4	3	3	3
Total Score	**16**	**19**	**24**	**23**	**27**

SCDES's Preferred Alternative

Alternative 5

- Source Area Treatments: ISCO, ISCR, and ISA.
- MNA, IC, and CvC to follow, along with 5 year reviews.
- Cost: $2,393,000 over a 30-year period.

Community Acceptance

Comments from the public will be carefully considered by SCDES prior to the final remedy selection.

Public Comments will be included in the Responsiveness Summary of the Record of Decision, along with SCDES's responses.

Public Comment Period

SCDES will accept written comments on the Proposed Plan during the public comment period. Please submit your written comments to:

Genevieve Keller-Milliken //

Project Manager

SCDES, Bureau of Land & Waste Management

2600 Bull Street, Columbia, SC 29201

genevieve.kellermilliken@des.sc.gov

803.898.0722

des.sc.gov

Public Comment Period

March 11, 2025 -

April 14, 2025

www.des.sc.gov/shakespeare

SC DEPARTMENT *of* ENVIRONMENTAL SERVICES

Get in touch

Genevieve Keller-Milliken // Project Manager

SCDES, Bureau of Land & Waste Management

2600 Bull Street, Columbia, SC 29201

genevieve.kellermilliken@des.sc.gov

803.898.0722

des.sc.gov

Elisa Vincent // Contract Coordinator

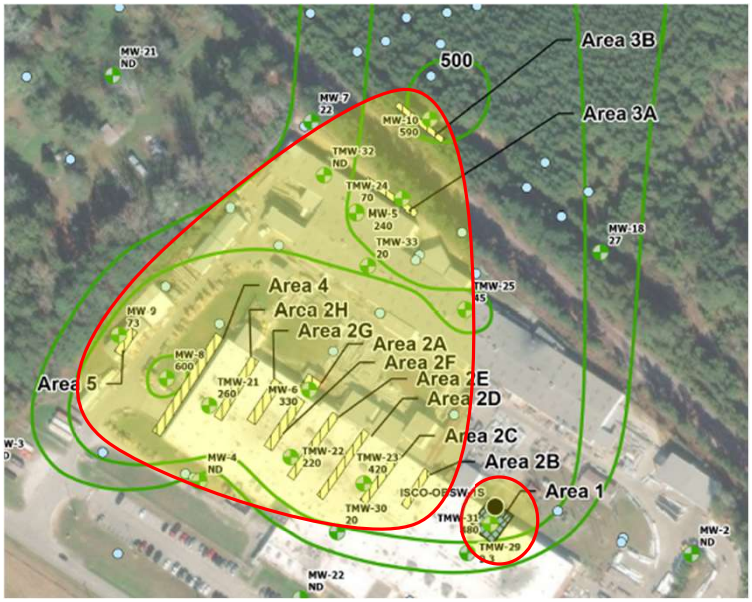
Lucas Berresford // Section Manager

@SouthCarolinaDES

Criterion	Alternative 1 No Action	Alternative 2 MNA, IC & CvC	Alternative 3 ISCO, MNA, IC & CvC	Alternative 4 ISCO, ISERD, MNA, IC & CvC	Alternative 5 ISCO, ISCR, MNA, IC & CvC
Protection Human Health and the Environment	Does not protect human health nor the environment.	ICs restrict use of land and groundwater. Human health is protected during monitoring efforts.	Treats source area contamination. Provides protection of human health and the environment throughout the remedial process.	Treats source area contamination. Provides protection of human health and the environment throughout the remedial process.	Treats source area contamination. Provides protection of human health and the environment throughout the remedial process.
	1	3	4	4	4
Compliance with ARARs	Does not comply with ARARs.	Complies with ARARs in a longer time frame in areas not under land use controls	Complies with ARARs in a longer time frame in areas not under land use controls	Complies with ARARs in a longer time frame in areas not under land use controls	Complies with ARARs in a longer time frame in areas not under land use controls
	1	2	3	3	3
Short-Term Effectiveness	Do not provide short-term effectiveness.	Provides short-term effectiveness with IC, but with no active treatment on source area CVOCs	Provides short-term effectiveness with ISCO, ICs. ISCO works faster than ISERD and ISCR but will require more injections at the overall site.	Provides short-term effectiveness with ISCO, ICs. ISERD works slower than Alternatives 3 and 5.	Provides short-term effectiveness with ISCO, ICs. ISCR works slower than Alternative 3 but requires significantly fewer injections overall.
	1	2	4	3	5
Long-Term Effectiveness and Permanence	Do not provide long term effectiveness	Provides some long-term effectiveness through monitoring and ICs.	Provides more long-term effectiveness through active treatment of source zone. More effective than Alternative 4 as a pH buffer is not needed. Treatment by ISCO is irreversible.	Provides more long-term effectiveness through active treatment of source zone. Less effective than Alternatives 3 and 5 as a pH buffer is needed. Treatment by ISCO, ISERD is irreversible.	Provides more long-term effectiveness through active treatment of source zone. More effective than Alternative 4 as a pH buffer is not needed. Treatment by ISCO, ISCR is irreversible.
	1	2	3	3	4
Reduction of toxicity, mobility, & volume through treatment	Does not actively reduce toxicity, mobility nor volume by active treatment.	Does not actively reduce toxicity, mobility nor volume by active treatment.	Reduction in toxicity and volume through ISCO treatment. Does not directly address mobility.	Reduction in toxicity and volume through ISCO, ISERD treatment. Reduction in mobility through adsorption, though saprolite soils may cause some ineffectiveness.	Reduction in toxicity and volume through ISCO, ISCR treatment. Reduction in mobility through adsorption, though saprolite soils may cause some ineffectiveness.
	2	2	3	4	4
Implementability	No issues to be implemented.	Resources are readily available. Facility owner appears to be amiable to ICs.	Resources are readily available. Facility owner appears to be amiable to ICs. Pilot study shows that the injections are feasible.	Resources are readily available. Facility owner appears to be amiable to ICs. Pilot study shows that the injections are feasible. pH buffer will need to be introduced into target aquifer.	Resources are readily available. Facility owner appears to be amiable to ICs. Pilot study shows that the injections are feasible.
	5	4	4	3	4
Costs	$0	$1,137,000	$2,653,000	$3,052,000	$2,393,000
	5	4	3	3	3
Total Score	**16**	**19**	**24**	**23**	**27**

Targeted Treatment Areas

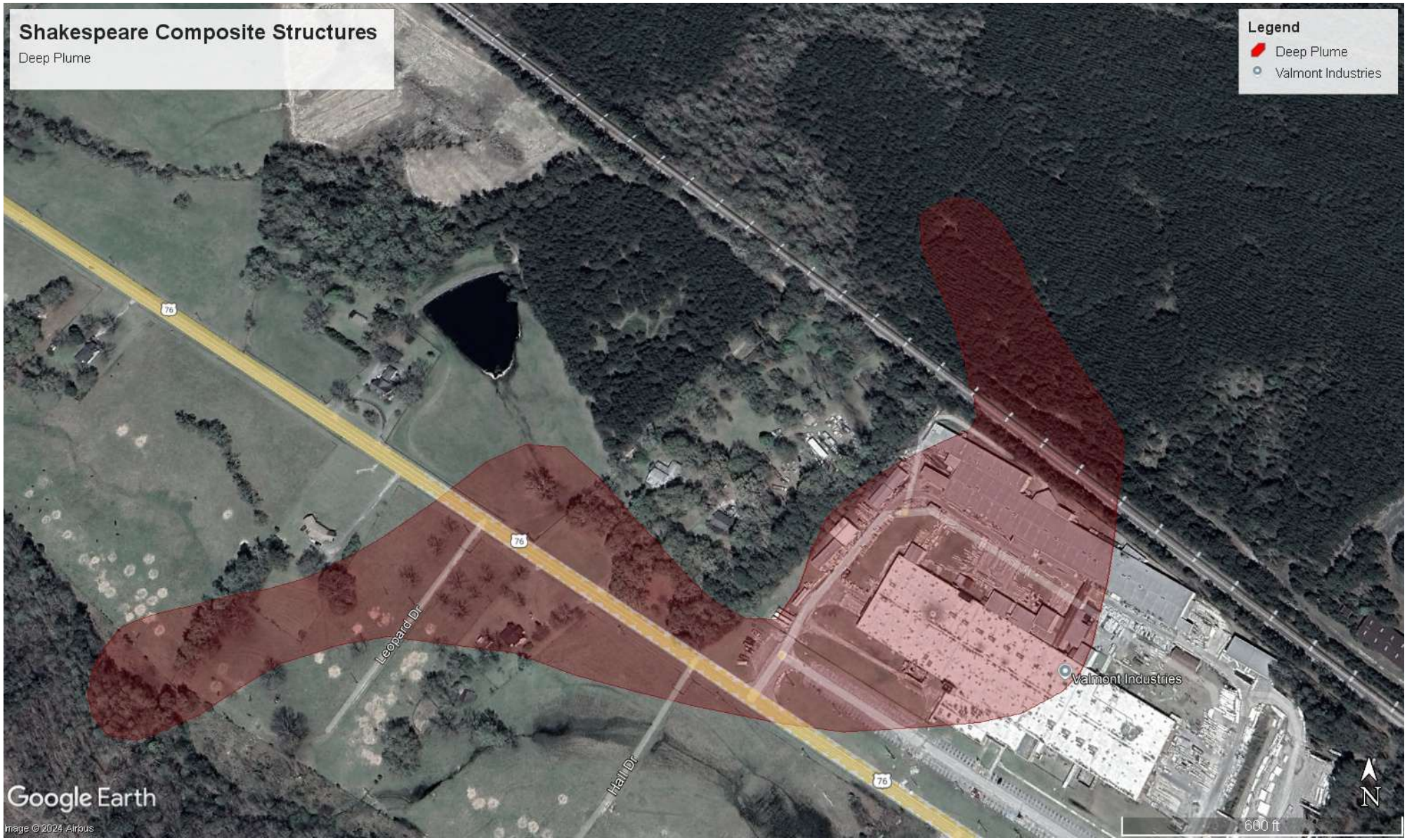
Shallow Zone



Intermediate Zone


Shakespeare Composite Structures
Shallow Plume
Legend
Shallow Plume
Valmont Industries
76
Leopard Dr
Hall Dr
Valmont Industries
Google Earth
Image © 2024 Airbus
N
600 ft


Shakespeare Composite Structures
Intermediate Plume
Legend
Intermediate Plume
Valmont Industries
76
Leopard Dr
Hall Dr
Valmont Industries
Google Earth
Image © 2024 Airbus
N
600 ft


Shakespeare Composite Structures
Deep Plume
Legend
Deep Plume
Valmont Industries
76
Leopard Dr
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Google Earth
Image © 2024 Airbus
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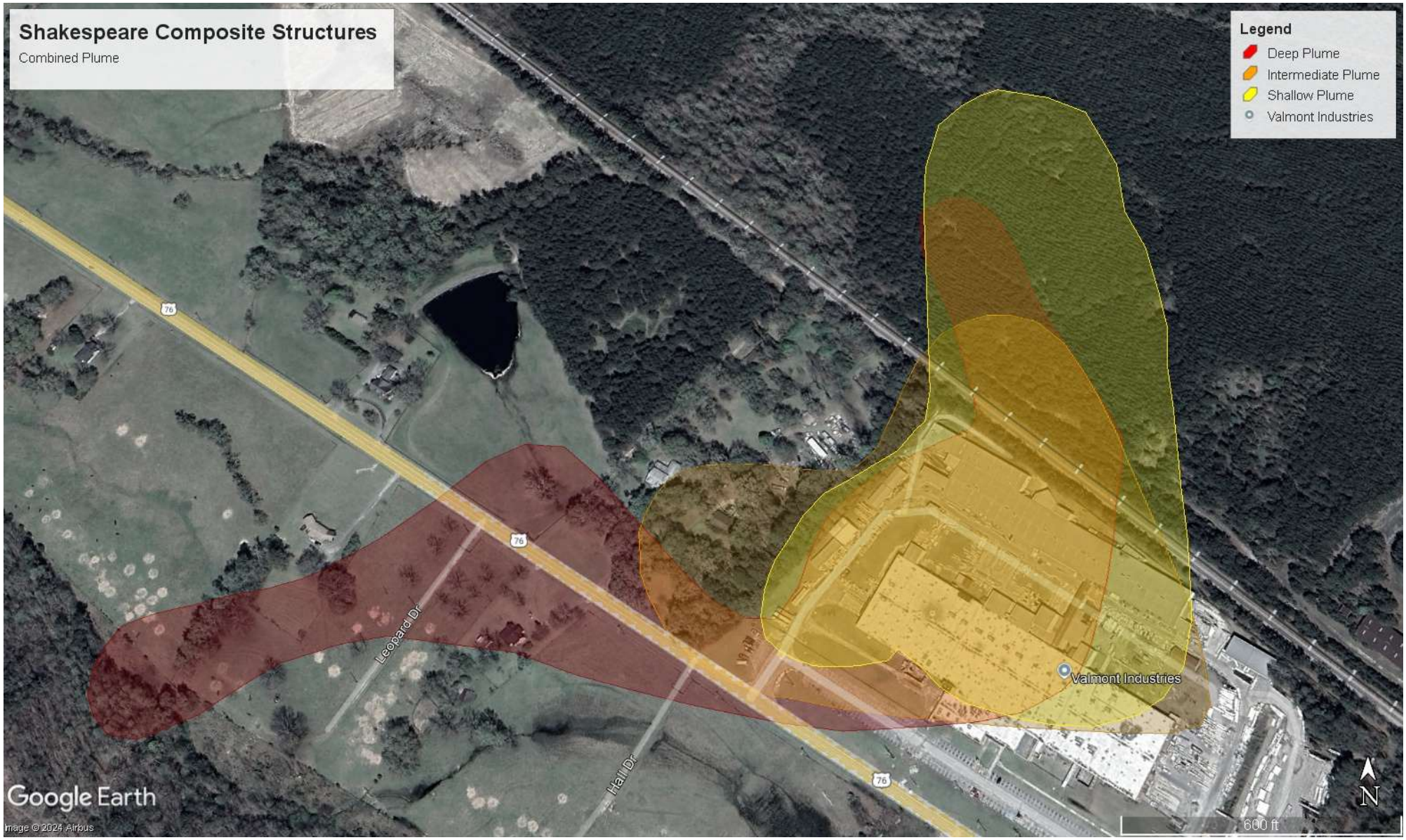
Shakespeare Composite Structures
Combined Plume
Legend
Deep Plume
Intermediate Plume
Shallow Plume
Valmont Industries
76
Leopard Dr
Hall Dr
Valmont Industries
Google Earth
Image © 2024 Airbus
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600 ft